MITEL

3300 IP Communications Platform

Technician's Handbook
Mitel Communications Director Release 4.2

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Technician's Handbook
Mitel Communications Director (MCD) Release 4.2
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Chapter 1

Getting Started

Purpose of This Handbook

This handbook provides instructions to install, upgrade, maintain and troubleshoot the Mitel® 3300 IP Communications Platform (ICP). This handbook is written for certified 3300 ICP technicians. For information on programming, please refer to the System Administration Tool Help system.

Symbols Used in the Handbook

Note: Provides important details.

Tip: Provides additional information you should know about a topic.

Time: Indicates the time it takes to complete a procedure.

CAUTION: Indicates a potentially hazardous situation that could result in damage to the equipment.

Safety Instructions

A printable version of the Safety Instructions is available on the Mitel Customer Documentation web site.

CAUTION: Read the safety instructions before performing the procedures in this handbook.

CAUTION: Failure to follow all instructions may result in improper equipment operation and/or risk of electrical shock. Refer to "3300 Safety Instructions" for complete safety information.

CAUTION: To prevent ESD damage to the equipment: (1) Ensure that the system is grounded before you install a card. (2) Whenever you handle cards, wear an anti-static strap (attached to the cabinet). (3) When removing cards from the cabinet, immediately place them in an anti-static bag.

CAUTION: All installation, field replacement, and servicing procedures must be carried out by service personnel who have successfully completed the Mitel Installation and maintenance training course.

CAUTION: Hardware is sensitive to shock and vibration; handle hardware with care.

CAUTION: Provide a permanent ground for all controllers and units through the ground connection on each cabinet.

CAUTION: BRI Interface is not available in Taiwan. Use of this interface is prohibited.

CAUTION: When sold in Taiwan, the MXe Controller supports ISDN T1/E1 and Leased Line T1. However, it does not support Leased Line E1 and ISDN BRI in Taiwan.

Note: The ground symbol within a circle identifies the terminal to be connected to an external protective conductor. Connect this terminal to earth ground before you make any other connections to the equipment.

Start Here Guide

What You Received

- ❒ 3300 ICP Controller
  - Set of feet and rack mounting hardware
- ❒ Hardware Components
  - System i-Button (except in MXe Server)
  - Hard drive (ordered separately for MXe, CX, CXi, CX II and CXi II) or Compact Flash Card (AX only)
- ❒ Software
  - MXe, CX, CX i CX II and CXi II: provided on separately ordered hard drive; see Appendix E on page 375 for part numbers.
  - AX and MXe Server: Mitel Communications Director Installation CD (included with controller)
- ❒ Optional Hardware, such as
  - RAID Hardware and hard drives (2)
  - Redundant Power Supply
  - NSU, ASU

What You Need for Installation

- ❒ Phillips screwdrivers
- ❒ Anti-static strap
- ❒ CAT 5 or better cable with RJ-45 connector
- ❒ Computer for programming the 3300 ICP
- ❒ IP addresses for the controller, E2T, and IP telephones
- ❒ List of purchased options and password
- ❒ IMAT (not required for embedded PRI)

Preparation

- ❒ Review your purchase order
- ❒ Complete Appendix B: “Installation Planner” on page 275
- ❒ Review Appendix C: “Typical Network Configurations” on page 305

Initial Setup

- ❒ "Connect PC to Controller" on page 13
- ❒ "Establish Communication with Controller" on page 25
- ❒ "Enable Licenses and Options" on page 29

Install Hardware

- ❒ "Determine Controller Module Configuration" on page 39
- ❒ "Identify Controller Component Options" on page 44
- ❒ "Remove Controller Cover" on page 47
- ❒ "Install Controller Modules" on page 48
- ❒ "Install Controller Stratum 3 Clock Module" on page 50
- ❒ "Install Controller Hardware" on page 50
- ❒ "Rack Mount the Controller" on page 51
- ❒ "Install Service Units and Cabinets" on page 58
- ❒ "Install Telephones" on page 64
- ❒ "Install and Configure Music on Hold" on page 65
- ❒ "Register IP Devices from the Telephone" on page 67

Program System

- ❒ "Log into the Programming Tools" on page 71
- ❒ "Configure NSU via IMAT" on page 74
- ❒ "Program the Controller DHCP Server (MXe, CX/CXi, CX II/CXi II)" on page 76
- ❒ "Program LS Trunk Settings via LS Measure Tool" on page 78
- ❒ "Configure Analog Music On Hold/Paging" on page 79

Install System Software

- ❒ Install the System Software:
  - "Install System Software Manually" on page 84
  - "Install System Software using the Software Installer" on page 90
- ❒ Upgrade system software:
  - "Online Upgrade" on page 93
  - "Offline Upgrade" on page 97

- ❒ “Installing MSL Software on APC (CX/CXi) or APC-CX(i) II (CX II/CXi II)” on page 104

Maintain System

- ❒ “Back Up a Database” on page 128
- ❒ “Migrate SX-2000 Database Across Platforms” on page 133
- ❒ “Export Configuration Data” on page 136
- ❒ “Import Configuration Data” on page 137
- ❒ “Assign Static IP Addresses to IP Phones” on page 139
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- ❒ “Perform a System Reset” on page 127
- ❒ “Restore a Database” on page 130
- ❒ “Recover MXe Server” on page 143

Install and Replace Units

- ❒ “Component Replacement Notes” on page 155
- ❒ “Add or Replace Controller FRUs” on page 162
- ❒ “Add or Replace Controller FRUs” on page 162

About the 3300 ICP

The 3300 ICP is a Voice over IP solution that delivers robust call control, extensive features and supports a wide range of desktop devices and applications for medium-to-large enterprises. There are several system configurations:

- the CX and CX II with embedded analog
- the CXi and CXi II with embedded analog and embedded Layer 2 switch for sites with 8-100 lines (150 on CXi II);
- the MXe base with embedded analog supports 300 users before expansion;
- the expanded MXe supports 1400 users;
- the AX controller delivers an increased density of analog devices;
- the MXe Server provides capacity for up to 5000 simultaneous users.

3300 ICP Documentation - Mitel eDocs

For customer documentation, including Knowledge Base Articles, on all Mitel products go to the Mitel Edocs web site at http://edocs.mitel.com.

Tip: You must have a Mitel OnLine (MOL) account to access technical documentation on Mitel Edocs. Access to end-user documents, such as telephone user guides, does not require an MOL account.

Create Telephone User Guides with ManualMaker

Note: Although still available, ManualMaker is neither accessible from Mitel Online nor is it being updated when new sets and features are introduced. To get current guides in PDF format for all supported sets, visit the Customer Documentation web site (click 'PDF Guides' on the 'Other' menu.) Some guides are also provided in Microsoft® Word format and can be customized subject to the terms and conditions described on the web site.

Access Your Mitel Options Password

You must obtain your Mitel Options Password through Mitel OnLine (www.mitel.com). You will create your application record on the AMC via Mitel Online (see "Enable Licenses and Options" on page 29). This password is required during a software upgrade or installation procedure. A new password has been issued to you if you are purchasing new options.

Mitel recommends using online synchronization with the AMC to update your password. Using online synchronization will allow you to license your controller software and options immediately. Remember to print a record of your options for future reference.

If you do not have internet access where your controller is located:

Connect to AMC at Mitel Online and choose the manual licensing option. When you print your options page, it will include your password and Applications Record ID (ARID). Use this password when installing the options on your controller.

To upgrade software, confirm a current password, or purchase new options and receive a new password, use the AMC at Mitel Online any time.

Contacting Mitel

Order Desk

You can reach the Order Desk at 1-800-796-4835.

Repair Services Department

You must get a Return of Merchandise Authorization (RMA) form from the Repair Services Department before sending equipment back to Mitel.

If you are in North America, you can reach the Repair Services Department at 1-888-222-6483.

If you are in any other region, contact your local regional support service.

Technical Support

Please contact Mitel Technical Support if you require technical assistance.

If you cannot resolve the problem by using the 3300 ICP Troubleshooting Guide, please collect the required information listed in the applicable section(s) of the 3300 ICP Troubleshooting Guide **before** calling Mitel Technical Support.

If you are in North America, you can reach Technical Support at 1-800-561-0860 or 1-613-592-2122.

If you are in any other region, contact your local regional support service. For regional contact information, follow the “Contact Us” link at Mitel.com.

Chapter 2

Initial Setup

Connect PC to Controller

To configure the system, you must connect a PC to the controller.

PC Requirements

You need a Windows-based computer to program, maintain and troubleshoot the 3300 ICP, and to install/upgrade the MCD software.

Computer Recommendations

- Windows® NT 4.0, Windows 2000, Windows XP, or Windows Vista Business or Ultimate.

Computer Requirements

- Windows 98, Windows NT 4.0, Windows 2000, Windows XP, or Windows Vista.
- Network interface card (NIC)
- 1 GB free disk space (minimum)
- Internet Explorer 6.0, 7.0 or 8.0 with the latest Service Pack and 128-bit encryption. (IE 7.0 or 8.0 can be used with Rel 7.1 UR2 and later.)
- JRE (Java Run-time Environment) 1.6.0_1 or later installed
- VT100™ emulator program
- FTP Server (can be installed with Microsoft® IIS or PWS, for example)

Tip: Windows 98 with PWS does NOT include an FTP server application required for installations of 3300 ICP Software before Rel 8.0, and will not work for the software installation/upgrade process unless a third-party server application is used. If you are upgrading Rel 8.0+ software on a Rel 8.0 or 8.0+ system, you don't need an external FTP server.

AX, MXe, CX, CXi, CX II and CXi II Controller

1. Connect an RS-232 straight DTE male to female serial cable between the controller's **Maintenance** port and the PC's serial port (cable not provided).
2. Program the PC's serial port (from the communication program) with the following settings:
   - Baud Rate: **9600**
   - Data Bits: **8**
   - Parity: **None**

- Stop Bits: **1**
- Flow Control: **None**

3. Connect a straight-through Ethernet cable (RJ-45) from the controller leftmost Ethernet port (port 17 on the CXi and CXi II; port 1 on the CX, CX II, MXe, and MXe Server) and the PC's network interface card (NIC). When connecting to the AX, either Ethernet port will work.
4. Program the PC's NIC with the following settings:
   - IP Address: **192.168.1.n** (where n is a value between 30 and 254)
   - Subnet Mask: **255.255.255.0**

Note: For the MXe Server, the controller IP is the System IP address; default 192.168.1.5. Reserve 8 consecutive IP addresses for the MXe Server.

Power Up the Controller

1. Connect the female end of the power cable to the controller, and secure it with the latch (if provided).
2. Connect the other end of the power cable to a protected outlet. Turn on power switch (MXe, MXe Server, CX/CXi, and CX II/CXi II). If there are two power supplies, ensure that both power switches are turned on. The controller starts up.

Time: The controller can take up to 15 minutes to start-up.

3. Proceed to "Establish Communication with Controller" on page 25

MXe Server

Unlike the other 3300 ICP controllers, the MXe Server arrives complete, with all of the software pre-installed on the hard disk. This includes the Mitel Communications Director (MCD) software and the VxWorks virtual machine. There is still some configuration and licensing work to do before the MXe Server can be used in your network, though, and the instructions are provided in this section.

The MXe Server is shipped with an Application Processor Card (APC-MXe) that runs the MCD call control software. Also included standard on the MXe Server are the RTC and the E2T cards. All of these processors must be able to communicate with each other, so IP addresses must be assigned to all of them.

Tip: If you are replacing an existing 3300 ICP controller with an MXe Server and you want to use the same system IP address for the MXe Server, initially you will only be able to connect to the MXe Server from the local subnet. Before you can connect to the MXe Server from other subnets, you must manually clear the router ARP cache or wait until the router ARP cache is automatically updated. Refer to the latest 3300 ICP Release Notes for instructions.

Tip: The MXe Server is shipped with two hard drives, one with the software loaded and one blank. Before continuing, mirror the blank drive starting at Step 11 of the procedure described in “Replace One Hard Drive in an MXe II/MXe Server” on page 211.

The MXe Server is shipped with default IP addresses assigned. The defaults are shown in Table 1.

Table 1: Default IP Addresses for the MXe Server

ESM Name	Default IP Address/ Subnet Mask
Virtual subnet	192.168.1.4/30
System IP Address	192.168.1.5/30
Reserved IP Address	192.168.1.6/30
Virtual broadcast	192.168.1.7/30
APC IP Address	192.168.1.8/24
Media Gateway IP Address	192.168.1.2/24
E2T Card IP Address	192.168.1.3/24
Layer 2 (L2) Switch IP Address	192.168.1.1/24

Before You Begin

To complete this procedure, you will require

- ❒ Laptop
- ❒ Communications application (for example, Hyperterminal)
- ❒ RS-232 serial cable
- ❒ Ethernet cable (straight-through)
- ❒ MCD Software Installer tool
- ❒ Application Record Identification Number (AMC ARID)

Connect Laptop PC

1. Power up the MXe Server and wait approximately 3 minutes for the software to enable the printer port.
2. Connect the RS-232 serial cable between the COM 1 port on your laptop to the server printer port (see Figure 1).

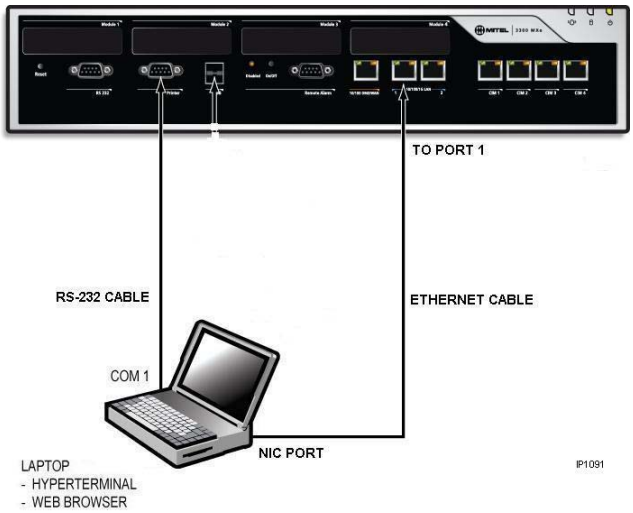

Figure 1: Laptop Connections

3. Open a communication application (for example ProCom or Hyperterminal) on your laptop to the 3300 ICP and set the connection parameters as follows:

Table 2: Communication Connection Parameters

Parameter	Required Setting
Port	COM 1 (example only)
Bits Per Second	38400
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
Emulation	VT100

Configure MAS Parameters

4. After the Server Console screen appears, you are prompted to accept the End-User License Agreement. Select **Accept**.
5. In the configuration screens, select the following settings:

Table 3: MAS Configuration Parameters

Configuration Screen	Required Setting
Restore from Backup (this screen relates to a backup of the Linux database)	Select **No**.
Choose Linux Admin Password	Enter a password. Then, enter it again to verify it. Note that passwords are case-sensitive. Also, see Caution below this table.
Select Primary Domain Name	Enter name (for example **mitel.com**)
Select System Name	Enter name (for example the company name)
Enter Local Networking Parameters (local IP address for this server)	Enter **192.168.1.8** (INITIALLY, KEEP AS DEFAULT!!!)
Select Local Subnet Mask (see Note below)	Enter **255.255.255.0**
Select Operating Mode	Select **Server-only**
Select Gateway Address	Enter **192.168.1.1** (INITIALLY, KEEP AS DEFAULT!!!)
Set DHCP Server Configuration	Select **Off - Do not provide DHCP Service to local Network**
Corporate DNS Server Address	Enter your corporate DNS server IP address.
Application Record ID	Leave field blank. Click **Next**.
Activate Configuration changes	Select **Yes**

Note: Use 255.255.255.0 unless your network requires a different subnet mask. If your network requires a different Local Subnet Mask, change it now. You can only change the subnet mask through the server console. In the MAS Server Manager application, the subnet mask is a read-only field.

CAUTION: Ensure that you record your Linux Admin password. If you lose this password, it cannot be recovered. You will have to re-install the MAS software and set a new password.

Configure Server Manager Fields

6. Connect the ethernet cable from the Network Interface Card (NIC) connector on your laptop to Port 1 of the MXe Server.
7. On your laptop set the NIC IP address to 192.168.1.20. The following steps are for Windows 2000 or Windows XP operating systems:
   - Click **Start**, click **Settings**, click **Network and Dialup Connections**, and then click **Local Area Network Connection**
   - Select **Internet Protocol (TCP/IP)**
   - Click **Properties**
   - Select **Use the following IP address**
   - Enter the following IP address: 192.168.1.20
   - Enter Subnet Mask (use the same Subnet Mask that you configured for the APC)
   - Click **OK**
   - Click **Start**, click **Settings**, click **Network and Dialup Connections**, and then click **Local Area Network Connection.** Ensure that the connection is **Enabled**.
8. Launch Microsoft Internet Explorer and go to the following URL: ***https:/192.168.1.8/server-manager***.
9. At the login page, enter
   Username: admin
   Password: (enter the Linux admin password that you set through the Server Console). The Managed Application Server Manager application opens.
10. Under **Applications**, click **Mitel Communications Director**. The Mitel Communications Director screen is displayed:

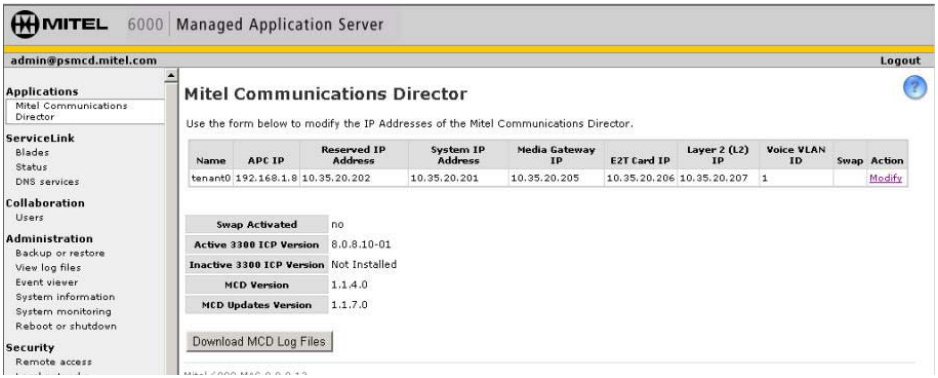

Figure 2: Example of Mitel Communications Director Screen

11. Click **Modify** to change the existing System IP Address and the APC Gateway Address.

12. Enter the new System IP Address and APC Gateway Address.

13. The IP addresses in the following screens are examples only.

Figure 3: Change the System IP and APC Gateway Addresses

14. Click **Next**. After you click **Next**, you should see a message stating that the addresses were successfully modified displayed in green text. The system automatically reserves four IP addresses that are required to support the system in the network. These addresses must be valid, contiguous, and available in the network.

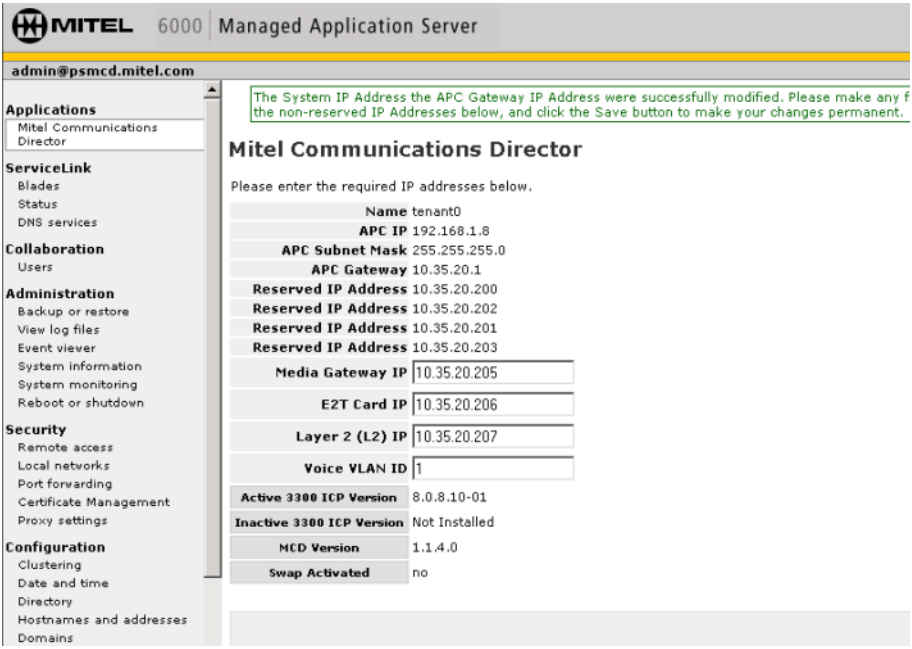

Figure 4: Enter the New Addresses

15. Enter three, valid, available, and contiguous IP addresses for the

- Media Gateway IP (IP address of the Real Time Controller card)
- E2T Card IP
- Layer 2 (L2) IP

16. Enter the Voice VLAN ID (1 to 4093), if required for the network.

At the bottom of the Mitel Communications Director screen, the following information is displayed:

Active 3300 ICP Version: currently active system software version

Inactive 3300 ICP Version: previous system software version before

latest upgrade. On an initial installation of the 3300 ICP, this field displays "Not Installed".

MCD Version: current Mitel Communications Director software version that was installed from the system software CD-ROM. It is NOT the software version of the MCD blade software.

Swap: reboots the call server with the currently inactive software version. The currently active version becomes the inactive software version after the reboot. Swap is only displayed if an Inactive version of the 3300 ICP software is installed.

Do not enable the **Swap** option during this procedure.

17. Click **Save**. The E2T and RTC cards are updated with the new IP addresses, subnet mask, and VLAN ID.
18. Open a communication application (for example ProCom or Hyperterminal) on your laptop to the 3300 ICP and set the connection parameters (see Table 2). Log in to the server console again.
    Login: admin
    Password: (enter the Linux admin password)
19. Select “Configure this server”. Press the **Tab** keyboard key until “Local Networking Parameter” is displayed.
20. Enter the IP address of the APC-MXe card that is appropriate for your network. The Gateway IP address changes to x.x.x.1.
21. Press the **Tab** keyboard key until the Reboot screen appears.
22. Reboot the server.
23. Change the address of the laptop’s Network Interface Card (NIC) back to the IP address for your network. The following procedure is for Windows 2000 or Windows XP:
    - From the Windows **Start** menu, click **Settings**, click **Network and Dial-up Connections**, and then click the Local Area Network of the laptop NIC card.
    - Click **Properties**.
    - Select Internet Protocol (TCP/IP).
    - Click **Properties**.
    - Click “Use the following IP Address” option.
    - Change the address of the NIC to the Network IP Address.

- Click **OK**.
- In the Network and Dial-up Connections window, right-click on the connection for the laptop NIC and click **Enable**.

You can now connect to the Mitel Communications Director through gigabit ethernet Port 1 of the MXe Server.

24. Launch Microsoft Internet Explorer and go to the following URL: ***https:/<your APC IP>/server-manager***.

25. At the login page, enter
Username: admin
Password: (enter the Linux admin password that you set through the server console). The Server Manager application opens.

26. If the PC that you use to run the MCD Software Installer is not installed on the same network as the MXe Server, you must add the network. Under **Security**, click **Local Networks** and add the IP address of the network. Also add the networks of any other Mitel applications or tools, such as OPS Manager, Enterprise Manager, system administrator client stations and so forth that require access to the MXe Server. To extend privileges to a network:
    - Under **Security**, click **Local networks**.
    - Click **Add network**.
    - Enter the Network Address.
    - Enter the Subnet Mask.
    - Enter the Router.
    - Click **Add**.

27. If the system is connected to the internet, the date and time is set automatically from a Network Time Server. Optionally, you can set the date and time manually:
    - Under **Configuration**, click **Date and Time**.
    - Click **Disable Network Time Server**.
    - Click **Save**.
    - Set the date, time, and time zone.
    - Click **Save**.

28. From the Software Installer, connect to the MXe Server.

29. Re-license the 3300 ICP software on the MXe Server. See "Licensing the MXe Server with AMC" on page 23 for instructions.

30. Launch the 3300 ICP System Administration Tool and enter the following maintenance command:
    - UpgradeBootrom ALL
31. Launch the Group Administration tool and set the system date and time.

Licensing the MXe Server with AMC

1. Change the IP address of your PC back to its address on your network.
2. Re-connect your PC NIC to your corporate network.
3. Connect the MXe-Server's Gig LAN Port 1 to your corporate network.
4. Install and run MCD Software Installer (release 8.0 or later).
5. Click on the **MXe Server** radio button.
6. Type in:
    - **APC IP address**: <APC IP address>
    - **Login** = root
    - **Password** = <your current MSL password>
    - **MN 3300 Login** = system
    - **Password** = password

    The **3300 ICP Address** is blank and you won't be able to edit it.
7. Click **Configure**.

Time: It may take a few minutes for the next screen to appear.

8. In the screen that appears, click on **License Atlas**. Click **Next**.
9. Click **License and Option Configuration**. Click **Next**.
10. On the Licensing screen, type your **ARID** and click **Retrieve Licenses**.
11. When the Options fields have been automatically filled in, click **Next**.
12. When the next screen appears, click **Start**.

Setting your DNS Server IP

1. Log in to the MXe-Server System Administration Tool (for example 10.x.y.25).
2. Navigate to the **System IP Properties** form.
3. On the lower panel, enter your corporate DNS Server IP address in the **DNS Server IP address** field.
4. Click **Save**.

Note: All of the IP addresses will be read-only in the System Administration Tool.

Verify the Connections

Perform the steps below to verify the connections between the Maintenance PC and the controller.

1. To verify the serial connection in the VT100 emulator, press ENTER.
   - If the serial connection is installed and programmed properly, a right-pointing arrow (→) is displayed when you press ENTER.
2. To verify the Ethernet connection from the PC:
   - **For the MXE Server:** PING the controller System IP address (default is 192.168.1.5).
   - **For all other controllers:** PING the controller RTC IP address (default is 192.168.1.2).
   - If the connection is installed and programmed correctly, the controller replies to the PING.

Establish Communication with Controller

Set Controller RTC IP Address (AX, MXe, CX, CXi, CX II, CXi II)

Tip: The Maintenance PC must be on the same subnet as the controller.

1. Start the communication program on the Maintenance PC.
2. Power up the controller (see page 14).
3. The communication program will instruct you to **Press <SPACE><SPACE><SPACE> to stop auto-boot AFTER countdown starts** (Release 5.2 and later) or **Press any key to stop auto-boot** (prior to Release 5.2).
4. When **[VxWorks Boot]:** is displayed, type **c** and press ENTER.
5. For each VxWorks setting shown in **bold** inTable 55 on page 282, enter a value, and then press ENTER. For all other settings, press ENTER to accept the default:

Tip: If DHCP (flags=0x40) is being used on the E2T, leave the inet on ethernet field blank.

- inet on ethernet (e), **IP address and subnet mask (hex) for controller RTC** (Get it from your IT administrator.)
- gateway inet (g), **IP address of the default gateway for the 3300** (must be outside the DHCP range)
- user (u), **ftp**
- ftp password (ftp)), **ftp**.

CAUTION: Do not use leading zeroes in the IP addresses. For example, enter 192.168.1.2; not 192.168.001.002.

6. At [VXWorks Boot], type @, or press the **Reset** button on the controller.

Time: The controller can take up to 10–15 minutes to restart.

Configure System IP Address (MXe Server)

To replace the default System IP address with a new IP address:

Tip: All of the MXe Server IP addresses must be on the same subnet.

1. Launch the MSL server console, and select **Configure this Server**.
2. Set the APC IP address to **192.168.1.8**.

Note: You must temporarily set the APC IP address to the default setting to be able to configure system IP addresses. Once you are done configuring these IP addresses, you will reset the IP address on the APC.

3. Disconnect the MXe Server from the network.
4. Configure a local PC with a static IP address on subnet 192.168.1.0/24 and connect it to the MXe Server. See Table 1 on page 15 for the list of addresses that will be used by the MXe Server.
5. Launch the web-based MSL Server-Manager, and select the Mitel Communications Director blade panel. The APC IP address will be read-only. This panel now allows you to configure system IP addresses, RTC, E2T, L2 IP, and Gateway IP. These IP addresses must be on the customer subnet. When you are finished configuring the IP addresses, click **Save**.
6. In the MSL server console menu, select **Configure this Server**, and reset the APC IP address to the customer subnet (same subnet as the above IP addresses).
7. Click **Activate Changes** (this will cause a system reset).

Configure the Layer 2 Switch (AX, MXe, CXi, CXi II)

The internal Layer 2 switch in the CXi, CXi II, and MXe must be programmed with an IP address in the same subnet as the RTC IP address, or the switch will not operate properly.

To set the Layer 2 switch IP address, complete the System IP Properties form, and then reboot the system.

Note: The 16 10/100 Mbps ports are disabled on the CXi and CXi II during bootup, as is the right-hand side (when viewed from the front) Gigabit port on the CX, CX II and MXe.

Tip: Refer to the System Administration Tool Online Help for detailed instructions on programming the IP Network Configuration forms associated with the CXi, CXi II, MXe, and MXe Server.

1. Connect an Ethernet cable between the Layer 2 switch on your network and one of the following ports:
   - leftmost available Ethernet (port 17) on the CXi and CXi II controller using a straight-through cable
   - the left Gigabit port on the CX, CX II, and MXe controller using a straight-through cable
   - either of the Ethernet ports on the AX controller using a cross-over cable.

Tip: For an MX or 100-user system, move the Maintenance PC Ethernet connection from the controller to one of the Layer 2 switch input ports, and connect the Layer 2 switch to the leftmost Ethernet port of the controller. You can do the same for an LX, 250, and a 700-user system, if desired.

2. Program the Layer 2 switch with the appropriate settings (see “Network Configuration Examples” on page 307 for more information).

Tip: Typically, in a VLAN environment, an access port is used to connect the Layer 2 switch to the controller, and trunk ports to connect the Layer 2 switch to the IP Phones.

Tip: IP trunks cannot work through the WAN port.

3. See your IT administrator for information to set up and program a DHCP server. We recommend that you use the controller’s internal DHCP server to provide a static IP address to the E2T.
4. If you are not using the controller’s DHCP server, disable it in the **DHCP Server** form.

Tip: See “Configuring a Windows 2000 DHCP Server (prior to Release 7.0)” on page 403 for information on programming 3300 ICP DHCP settings on a Windows 2000 DHCP server.

Configure the Layer 2 Switch (MXe Server)

The MXe Server starts with a default IP address for the internal Layer 2 switch, and all of the MXe Server IP addresses must be changed (at the same time) to sit on the same subnet as the L2 switch address.

Note: The Gigabit port on the MXe Server located on the right-hand side of the controller front panel is disabled during bootup.

Tip: Refer to the preceding initial setup procedures for detailed instructions on how to reset the system defaults and then reprogram new system IP addresses.

When you configure the Layer 2 Switch, ensure that you do the following:

1. Connect an Ethernet cable between the Layer 2 switch on your network and left Gigabit port on the MXe Server.

2. Program the Layer 2 switch with the appropriate settings (see "Network Configuration Examples" on page 307 for more information).

   Tip: Typically, in a VLAN environment, an access port is used to connect the Layer 2 switch to the controller, and trunk ports to connect the Layer 2 switch to the IP Phones.

   Tip: IP trunks cannot work through the WAN port.

3. See your IT administrator for information to set up and program a DHCP server.The MXe Server doesn't have an internal DHCP server, so you must use an external DHCP server.

   Tip: See "Configuring a Windows 2000 DHCP Server (prior to Release 7.0)" on page 403 for information on programming 3300 ICP DHCP settings on a Windows 2000 DHCP server.

Enable Licenses and Options

The online licensing process, managed by the Mitel Application Management Centre (AMC) allows Solution Providers who have accounts on the AMC to manage software licenses online. Each company is able to supply customers instantly if new licenses or options are required.

To enable or upgrade licenses and options, you must connect to the AMC using either the MCD Software Installer Tool or the 3300 ICP System Administration Tool. Connecting to the AMC Server requires specific settings for the Software Installer Tool and the System Administration Tool. Refer to "MCD Software Installer Tool Requirements for AMC" on page 30 and "3300 ICP System Requirements for AMC" on page 30.

If you want to be able to transfer licenses and options between controllers, do not choose to view the Mitel Options Password (MOP) in the AMC. Once you view the MOP, the licenses and options are “locked-in” to the controller (they are non-transferrable).

After completing changes to an account on the AMC, you can perform an automatic sync (recommended) with the AMC, which requires only that you enter the Application Record ID. If you have chosen to lock-in the licenses and options to the controller, you can perform an automatic sync, or you can manually enter the licenses and options in the controller. Manual entry requires that you enter the MOP.

To enable licenses and options on the controller, you only need to complete one of the following procedures:

Tip: It is recommended that you perform an automatic sync.

- “Automatic Sync with AMC via MCD Software Installer Tool (Rel 6.0 or later)” on page 31.
- “Automatic Sync via System Administration Tool” on page 33.
- “Manual License and Options Entry via MCD Software Installer Tool” on page 33.
- “Manual License and Options Entry via System Administration Tool” on page 34.

MCD Software Installer Tool Requirements for AMC

The PC that is running the Software Installer has the following network requirements:

1. **DNS Name Resolution:** Because the SI win32sync client performs a name lookup on "register.mitel-amc.com", the SI host PC needs to be properly configured for DNS name resolution.
2. **TCP/IP Source Port on the SI Host:** A Windows operating system will use an arbitrary high port for the TCP connection to the AMC. If the SI PC is behind a firewall, the firewall must allow connections from high ports (greater than 1024).
3. **TCP/IP Destination Port on the AMC:** The SI win32sync client will attempt to establish a connection to register.mitel-amc.com TCP port 22. After 5 seconds, if the connection is not established, the client will try port 8222. If there is still no success, the third attempt is with port 80 using the HTTP/1.1 protocol CONNECT method.
   If the SI PC is behind a firewall, the firewall must allow connection to at least one of port 22, port 8222, or port 8.
4. **SI Host PC behind an HTTP Proxy Server:** If the HTTP/1.1 CONNECT method is used and the SI PC is configured to use an HTTP proxy server, then the CONNECT request will be through the proxy server. This is the same method used by web browsers to establish HTTPS connections through proxy servers. If the SI host PC can reach https://www.mitel-amc.com from a web browser, then it should also be able to establish a win32sync connection by using the HTTP/1.1 CONNECT method. If there is a problem reaching https://www.mitel-amc.com from a browser on the SI host PC, then the firewall and/or proxy server on the customer premise may need to be reconfigured to allow HTTP/1.1 CONNECT requests.

3300 ICP System Requirements for AMC

1. **DNS Name Resolution:** Because the MiSync client performs a name lookup on "register.mitel-amc.com" and "sync.mitel-amc.com", the ICP needs to be properly configured for DNS name resolution using the System IP Properties form in the System Administration Tool.
2. **TCP/IP Source Port on the ICP:** The MiSync client will connect to TCP port 443 (https) on the AMC. If the ICP is behind a firewall, the firewall must allow TCP connections from the ICP to TCP port 443 on the AMC.

3. **ICP behind an HTTP Proxy Server:** The MiSync client uses HTTPS to communicate with the AMC. The HTTP/1.1 CONNECT method is the standard used by proxy servers to proxy HTTPS. There should be no extra configuration work required. See Step 4, “SI Host PC behind an HTTP Proxy Server” on page 30.
4. **CXi, CXi II, MXe-Specific WAN Considerations:** Program the Internet Gateway (WAN interface) IP address details (see "MXe Server/MXe/AX/CXi/CXi II Requirements for IP Networking" on page 278).

Automatic Sync with AMC via MCD Software Installer Tool (Rel 6.0 or later)

1. Launch the Software Installer and select either the **MXe Server** check box or the **3300 ICP** check box to get to the Login Dialog.
2. Enter the login information and the IP addresses. Click **Configure**.

Tip: If the SI is connecting to the MXe from behind a firewall, the firewall must be configured to allow https (443), ftp (20, 21), and ssh (22). Note that a DNS server is required.

3. Perform one of the following:
   - If the software load you need is a higher release than the software that is pre-loaded on the MXe Server’s hard drive, or if you are installing software on a 3300 ICP, click **Perform Upgrade**.
   - If the pre-installed software on the MXe Server is the latest release, click **License and Restore**, and then click **Perform Full Install**.
4. Specify the IP address username and password of the FTP server, or if you are using the 3300 FTP server, type in or browse to the location of the upgrade software.
5. Do one of the following:
   - If you selected **Perform Upgrade** in Step 3 of this procedure, then click **Next** to proceed to the **Define Upgrade Options** screen.
   - If you selected **Perform Full Install** in Step 3 of this procedure, click **Next** and then skip to Step 11.
6. In the **Define Upgrade Options** dialog, specify the Backup requirements and ensure that the License and Option Configuration box is checked.
7. Click **Next** to proceed to the **License and Options Selection** screen.

8. In the **License and Option Selection** screen, enter the **ARID** (Application Record ID) and click **Retrieve Licenses**.
   - If the licenses exist, the screen is updated with all of the licenses and options.
   - If the licenses do not exist, the Software Installer will try to connect to the AMC to get licenses.
   - If the licenses do not exist and the AMC cannot be reached, the Software Installer creates a batch file that contains the options. You can reconnect to the Software Installer later to run the batch file to license the options.

Tip: You will not be able to continue with the installation until the licenses have been obtained.

Tip: When using the License and Restore option, you must restore from a database backup file.

Tip: Enable the IP Networking option and MiTAI/TAPI Computer Integration option.

9. Click **Next** to display the progress screen.
10. Click **Start**.
11. If you selected **Perform Full Install** in Step 3, click **Next** to display the Define Upgrade Options screen, then
    - Deselect **Database Backup**.
    - Under Help Files, select **Do Not Install**.
    - Leave **Configure License and Options Configuration** selected.
    - Browse to the database backup file that you want to restore and select it.
    - Click **Next**.
12. In the License and Option Selection screen, enter the Application Record ID and select **Retrieve Licenses**:
    - If licenses exist, the screen is updated with the Purchased Options.
    - If the licenses do not exist, the Software Installer connects to the AMC to obtain the licenses.
    - If the licenses do not exist and the AMC cannot be reached, the Software Installer creates a batch file that contains the options. You can reconnect to the Software Installer later to run the batch file to license the options.

Tip: Enable the IP Networking option and MiTAI/TAPI Computer Integration options.

Tip: When using the License and Restore option, you must restore from a database backup file.

13. Click **Next** to display the progress screen.
14. Click **Start**.

Automatic Sync via System Administration Tool

1. In the System Administration Tool, access the **License and Option Selection** form and click **Change**.
2. Enter the **Application Record ID**, and then click **Retrieve Licenses**.

Tip: Enable the Networking Option and MiTAI/TAPI Computer Integration options.

3. Click **Next** to display the In Progress screen. Click **Save** to commit your changes.
4. Click **Start**. After the reboot is complete, log into the System Administration Tool and issue the **DBMS Save** maintenance command.
5. Issue the **DBMS Stat** command to verify the DBMS Save and to ensure that the DBMS_Initialized Flag is on.

Manual License and Options Entry via MCD Software Installer Tool

Note: This procedure is not supported on the MXe Server. Refer to the Software Installer Help for the offline licensing procedure for the MXe Server.

1. Launch the Software Installer and select either the **MXe Server** check box or the **3300 ICP** check box to get to the Login screen.
2. Enter the login information and the IP addresses. Click **Configure**.

Tip: If the SI is connecting to the MXe from behind a firewall, the firewall must be configured to allow https (443), ftp (20, 21), and ssh (22).
Note that a DNS server is required.

3. If the software load you need is a higher release than the software pre-loaded on the MXe Server's hard drive, or if you are installing on a 3300 ICP, click **Perform Upgrade**.
   If the pre-installed software on the MXe server is the latest release, click **License and Restore**.
4. If you selected **Perform Upgrade**, type in or browse to the location of the upgrade software.
5. Click **Next** to get to the **License and Options Selection** dialog.
6. Enter the number of licenses in the appropriate fields.
7. Select the appropriate Country variant and Configuration Options.
8. Click **Save** to commit your changes to the database.
9. **Reset** the controller (page 127).

Manual License and Options Entry via System Administration Tool

Note: This procedure does not apply to the MXe Server.

1. In the System Administration Tool, access the **License and Option Selection** form, and click **Change**.

Note: In Release 6.0 and later, you will see an Application Record ID field at the top of the form. Leave this field blank.

2. Select the appropriate Country variant and Configuration Options, and fill in the fields as required (see your Mitel Options sheet). For more information, click **Help**.

Tip: When you **Change** and **Save** in the License and Option Selection form (prior to Release 7.0), an error message that references "sysid # 65535" means that the SysID or i-Button is not installed or not seated correctly.

Tip: Enable **Networking Option** and **Mitai/Tapi Computer Integration**.

3. Enter the Mitel Options Password and click **Save** to commit your changes to the database.

Time: The Save procedure can take approximately three minutes.

4. **Reset** the controller (page 127).

Install the Online Help (Optional)

You can install the online Help on all 3300 ICP controllers with the exception of the AX controller using the Software Installer. For the AX controller, you must install the Help either on an external web server or locally on a PC.

To install online Help on a remote web server:

1. Copy and unzip the /Documentation/Help.zip file from the Mitel Communications Director software CD-ROM to a folder on the web server.
2. In the **Remote Help Server** field of the **System Options** form, enter the URL for the location of the Help files using the following syntax:

   http://<IP address of Remote Server>/help

   For example: http://10.117.7.39/help/
3. Click **Save.**

Tip: If the URL is not correct, Help window will display a "404 Page Not Found" error.

To install online Help locally on the PC:

Tip: If the Help files are installed locally on the PC, the Help buttons will not link directly to specific topics. Launch the Help separately and navigate to the desired topic.

1. Copy and Unzip the /Documentation/Help.zip file from the 3300 ICP software CD-ROM to a folder on the PC.
2. Open the sysadmin folder and create a shortcut to the sysadminhelpmain.htm file on the PC Desktop.
3. Double-click the shortcut to launch the Help.

Verify the Operation of the Controller

1. On the Maintenance PC, access the System Administration Tool.
2. In the **System Hardware Profile** folder, verify that the information in each of the forms is correct, including the IP address of the E2T for the MXe and 250/700-user system.
3. In **Maintenance and Diagnostics**, click **Alarm Details**.
   Verify that the following alarms do not appear (if you get an alarm, go to "Check Alarm State" on page 115):
   - E2T Com (not applicable to the AX, MX, CX/CXi, CX II/CXi II, or 100-user controller)
   - DSP

Tip: The next four steps are optional.

4. Connect two IP Phones directly to the controller's Ethernet ports (for an MX and 100-user controller, only the leftmost port is functional and you must use a Layer 2 switch for these steps).
5. Program the IP Phones (refer to the System Administration Tool Online Help for details).
6. Make a call from one phone to the other.
7. Disconnect the IP Phones from the controller.

Chapter 3

Installation and Programming

Install Hardware

Determine Controller Module Configuration

The following illustrations include available components for each controller. Refer to Chapter 6 on page 153 for installation instructions.

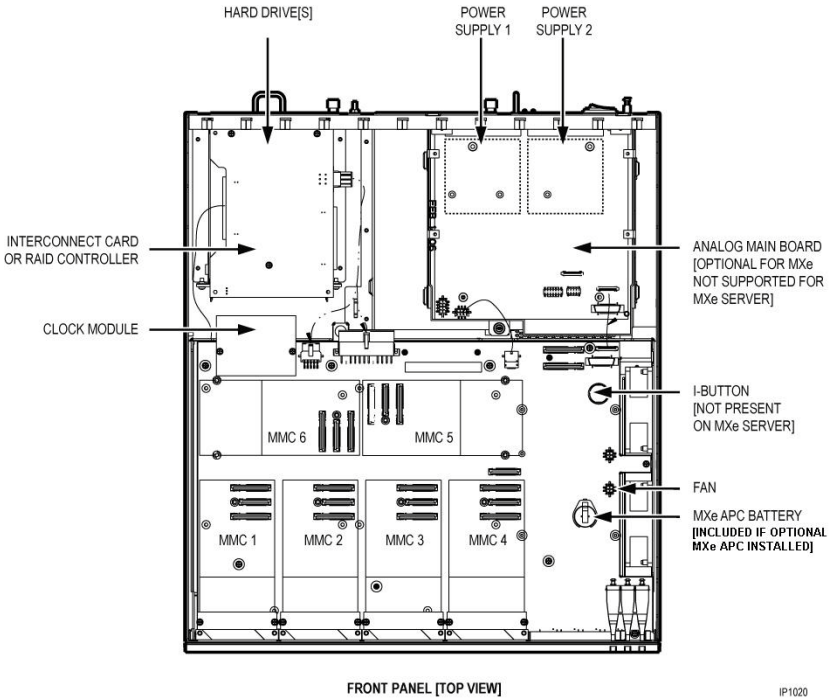

Figure 5: Slot Locations for the MXe Controller and MXe Server Card

Table 4: MXe Controller: Supported Modules

Module	MMC1	MMC2	MMC3	MMC4	MMC5	MMC6
FIM	Yes	Yes	Yes	Yes	No	No
T1/E1	Yes	Yes	Yes	Yes	No	No
BRI	Yes	Yes	Yes	Yes	No	No
						Page 1 of 2

Table 4: MXe Controller: Supported Modules (continued)

Module	MMC1	MMC2	MMC3	MMC4	MMC5	MMC6
CIM	Yes	Yes	Yes	Yes	No	No
DSP	Yes	Yes	Yes	Yes	Yes	Yes
DSP II	No	No	No	Yes	Yes	Yes
Echo Canceller	Yes	Yes	Yes	Yes	Yes	Yes
Page 2 of 2						

Table 5: MXe Server: Supported Modules

Module	MMC1	MMC2	MMC3	MMC4	MMC5	MMC6
DSP	Up to two DSP modules for additional compression					
DSP II	No	No	No	Yes	Yes	Yes
Echo Canceller	Yes	Yes	Yes	Yes	Yes	Yes

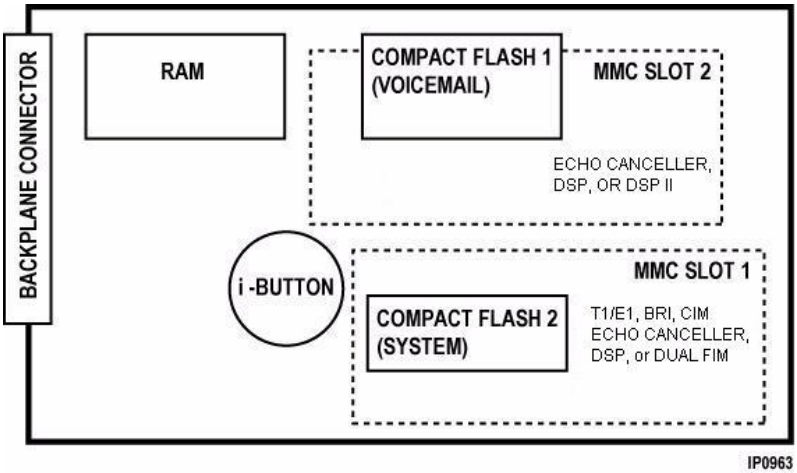

Figure 6: Slot Locations on the AX Controller Card

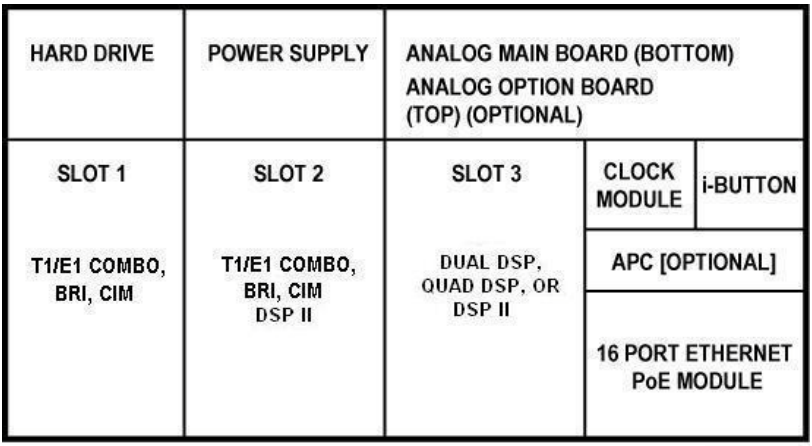

Figure 7: Slot Locations for the CXi Controller (with an Ethernet L2 Switch)

Note: Only three ASU ports are supported system wide.

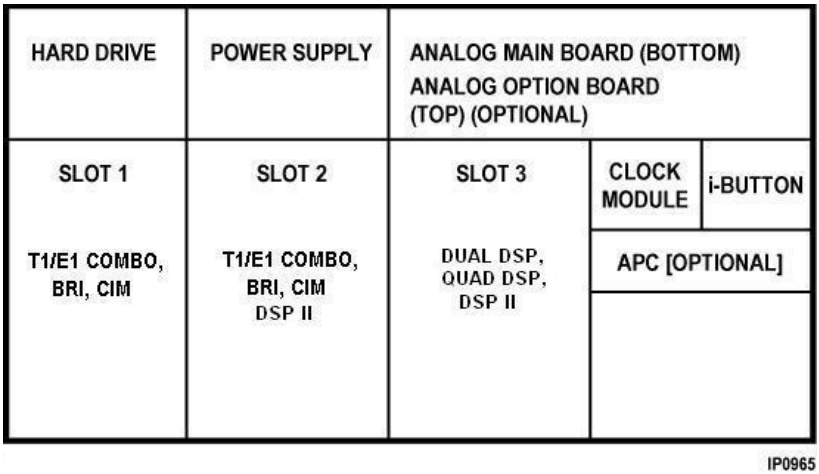

Figure 8: Slot Locations for the CX Controller (without an Ethernet L2 Switch)

Note: Only three ASU ports are supported system-wide.

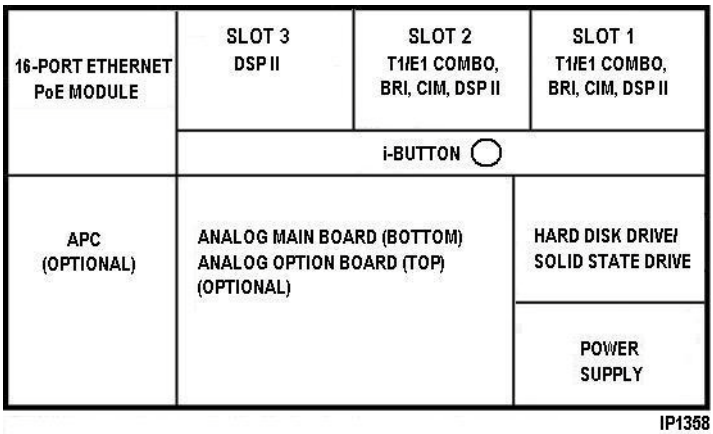

Figure 9: Slot Locations for the CXi II Controller (with an Ethernet L2 Switch with POE)

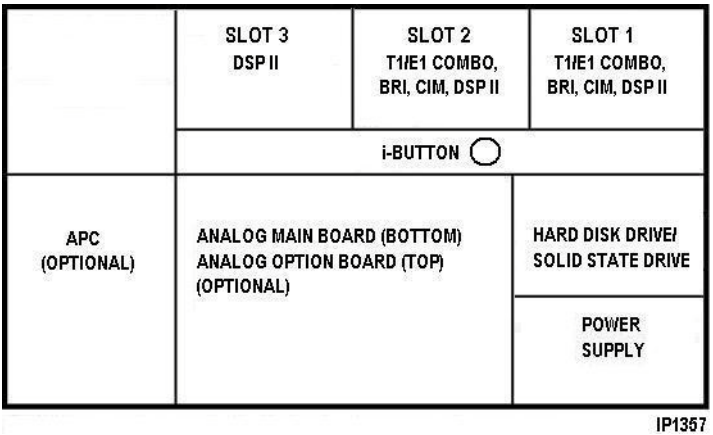

Figure 10: Slot Locations for the CX II Controller (without an Ethernet L2 Switch)

Power Supply	**Analog Main Board** Analog Option Board (optional, installed on AMB)		**Hard Drive**
	Clock Module		**SysID**
Slot 1 FIM, T1/E1, BRI, CIM	**Slot 2** FIM, DSP, T1/E1, BRI, CIM	**Slot 3** FIM, DSP, T1/E1, or BRI, CIM	**Slot 4** **DSP**

Figure 11: Slot Locations for the MX Controller

Power Supply	**Slot 8** DSP	**Slot 7** DSP	**Slot 6** Echo Canceller or DSP	**Slot 5** Echo Canceller
	SysID			
	Slot 1 FIM, T1/E1, BRI, CIM	**Slot 2** FIM, T1/E1, BRI, CIM	**Slot 3** FIM, DSP, T1/E1, BRI, CIM	**Slot 4** FIM, DSP, T1/E1, BRI, CIM

Figure 12: Slot Locations for the LX, 250, and 700-User Controllers

Power Supply		**SysID**		
	Slot 1 FIM, T1/E1, BRI, CIM	**Slot 2** FIM, T1/E1, BRI, CIM	**Slot 3** FIM, T1/E1, DSP, BRI, CIM	**Slot 4** DSP

Figure 13: Slot Locations for 100-User Controller

Identify Controller Component Options

Table 6: Controller Component and Upgrade Options

Processor Speed	2 G	450	450	533	266	300	300	450
Components	MXe[8] Server	AX[7]	MXe II[4]	MXe III[16]	CX/CXi CX/CXi II[3]	100/MX	250/ 700	LX
Embedded CIM[6]	—	—	√	√	—	√[2]	√	√
Quad CIM (page 168)[1]	—	√	√	√	√	√	√	√
FIM (page 166)	—	√	√	√	—	√	√	√
DSP (page 166)	√	√	√	√	√	√	√	√
Echo canceller (page 166)	√	√	√	√	—	—[14]	√	√
T1/E1 Framer (page 167)	—	√	√	√	—	√	√	√
BRI Framer (page 167)	—	√	√	√	√	√	√	√
T1/E1 Combo (page 167)	—	√	√	√	√	√	√	√
Line Cards (AX, ASU II) (page 232)	—	√	—	—	—	—	—	—
AMB (MXe) (page 171)	—	—	√	√	—	—	—	—
AMB (CX/CXi) (page 172)	—	—	—	—	√	—	—	—
AMB (CX II/CXi II) (page 174)	—	—	—	—	√	—	—	—
AOB (CX/CXi) (page 176)	—	—	—	—	√	—	—	—
AOB (CX/CXi) (page 177)	—	—	—	—	√	—	—	—
AMB (MX) (page 175)	—	—	—	—	—	√	—	—

Table 6: Controller Component and Upgrade Options (continued)

Processor Speed	2 G	450	450	533	266	300	300	450
Components	MXe[8] Server	AX[7]	MXe II[4]	MXe III[16]	CX/CXi CX/CXi II[3]	100/MX	250/ 700	LX
AOB (MX) (page 180)	—	—	—	—	—	√	—	—
Redundant Power Supply (page 223)	√	√	√	√	—	—	—	—
Hard Drives (page 204)	√	—	√	√	√	√	√	√
RAID controller (page 224)	√	—	√	√	—	—	—	—
Redundant Hard Drives Mxe II/MXe Server (page 210)	√[13]	—	√	—	—	—	—	—
Redundant Hard Drives Mxe III (page 216)	—	—	—	√	—	—	—	—
Stratum 3 Clock (page 169)	—[15]	—[9]	√	√	√[9]	√[10]	—[9]	—[9]
System ID Module (page 170)	—	—	—	—	—	√	√	√
System i-Button (page 170)	—	√	√	√	√	—	—	—
System Flash (page 234)	—	√	—	—	—	—	—	—
Voice Mail Flash (page 234)	—	√	—	—	—	—	—	—
E2T (page 201)	√	—	√	√	—	—	—	—
Application Processor Card[11] (APC-CX(i)) (page 187)	—	—	—	—	√	—	—	—

Table 6: Controller Component and Upgrade Options (continued)

Processor Speed	2 G	450	450	533	266	300	300	450
Components	MXe[8] Server	AX[7]	MXe II[4]	MXe III[16]	CX/CXi CX/CXi II[3]	100/MX	250/ 700	LX
APC-CX(i) II[12] (page 193)	—	—	—	—	√	—	—	—
Application Processor Card (APC-MXe)	√	—	—	—	—	—	—	—
Upgrading to a 1400-User System	—	—	√[5]	√[5]	—	—	—	—

Notes:
1. The Quad CIM requires Release 7.1 or later software. The CIM ports on the MXe Server are not available for use, but the LEDs will continue to flash.
2. Only 2 ports available.
3. The CX/CXi require Release 6.0 or later software. The CX II/CXi II require MCD 4.0 or later software.
4. The MXe II requires Release 7.0 or later software.
5. Requires the installation of a second processor, the E2T.
6. The embedded CIM is not an option and is not field replaceable.
7. The AX requires Release 7.1 or later software.
8. The MXe Server requires Release 8.0 or later software.
9. The CX II, CXi II and AX controllers use an *embedded* Stratum 3 Clock, so it is not field replaceable.
10. The 100 uses an embedded Stratum 3 clock, and the MX uses the replaceable Stratum 3 clock module.
11. The APC-CX(i) is available for the CX or CXi running Rel 7.1+ software.
12. The APC-CX(i) II is available for the CX II or CXi II running MCD 4.0+ software.
13. The Hard Drive 2 pack for the MXe Server comes with one of the hard drives loaded with the Communications Director software and the other one blank. Mirror the blank drive before using the Software Installer. See page 211.
14. The 100 user and MX controllers have embedded voice cancellation. They don't use the Echo Canceller MMC.
15. The MXe Server does not have any digital trunks, so it does not use a Stratum 3 clock.
16. The MXe III requires MCD Release 4.2 or later software.

Remove Controller Cover

To remove the controller cover:

1. Power down the controller (see page 127).
2. Disconnect all cables.
3. Remove cover as shown in Figure 14 or Figure 15.

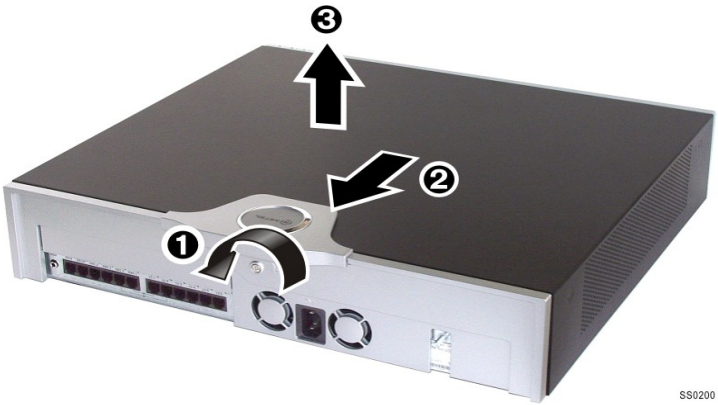

Figure 14: CX/CXi, CX II/CXi II - Removing the cover

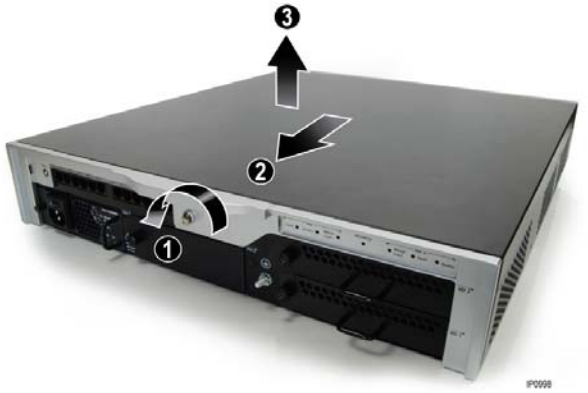

Figure 15: MXe/MXe Server - Removing the Cover

Install Controller Modules

Read the Safety Instructions before performing the procedures in this chapter (see "Safety Instructions" on page 3).

Tip: Before installing a 3300 ICP, **always** read the RN for the software you are installing (see "3300 ICP Documentation - Mitel eDocs" on page 8).

1. Shut down the controller (see page 127).
2. Disconnect all cables from the controller.
3. Remove the controller cover (page 47).
4. Remove the module from its packaging.

MXe, MXe Server, CX/CXi, CX II/CXi II

5. Remove the blank module cover at the front of the controller, and insert the module in an appropriate slot.
6. If you are replacing a defective module, remove the screws and lock washers and pull up on the module to remove it.
7. Secure the module to the controller using the screws and pillars provided with the module.
8. Tighten the controller faceplate screw nearest the MMC slot.
9. Replace the controller cover or the controller card.
10. Reconnect the cables to the controller.
11. Power up the controller.

AX

1. Remove the blanking plate (or the old MMC) from the controller by removing the screws that hold the standoffs to the controller. (The screws are on the back side of the controller card.)
2. Back off the controller faceplate screw nearest the MMC slot a couple of turns (because the screw interferes with the removal/insertion of T1/E1, Quad BRI, Quad CIM, or Dual FIM).
3. Slide the blanking plate out of the opening from the back of the controller faceplate.
4. Remove the two standoffs (closest to the face plate) from the blanking plate (or old MMC). Retain the standoffs and screws.

5. Fasten the standoffs to the front of the new MMC.

CAUTION: Proceed with extreme care to avoid damaging components on the controller card.

6. Carefully slide the MMC face plate under the lip of the controller face plate. See Figure 16. Do not push the MMC past the controller face plate as shown in Figure 17.
7. Re-install and/or re-tighten the screws.
8. Continue with procedure as described in the specific FRU instructions.

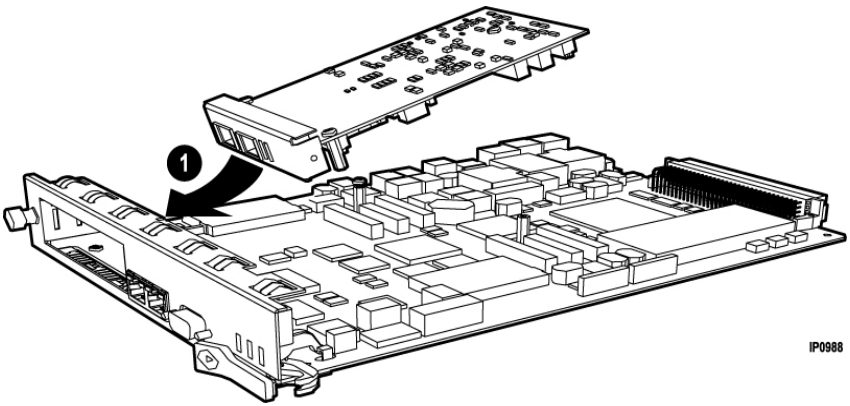

Figure 16: Position module at an angle (AX)

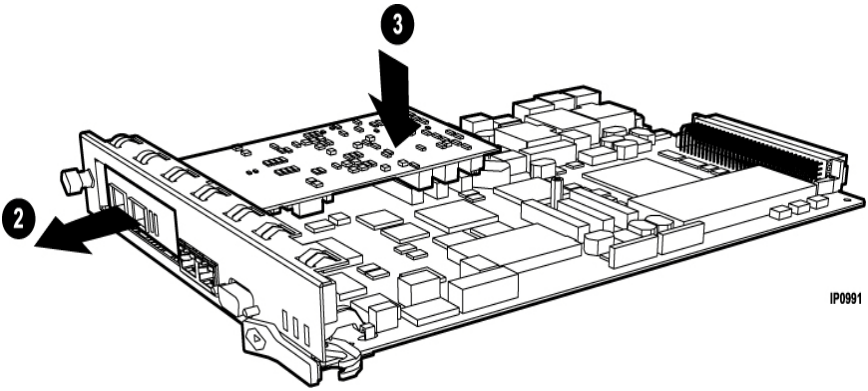

Figure 17: Slide in and seat module (AX)

Install Controller Stratum 3 Clock Module

To install the clock module in the CX/CXi, MXe, and MX:

Note: The other controllers use the Stratum 3 Clock, but in each case, the clock is embedded and is not field replaceable. The MXe Server does not use a Stratum 3 Clock.

1. Power down the controller (page 127).
2. Remove the controller cover (page 47).
3. Remove the screws from the clock module.
4. Remove the clock module.
5. Seat the new clock module onto the main board.
6. Replace the screws that you removed from the clock module.
7. Replace the top cover, and power up the controller (page 24).

Install Controller Hardware

Refer to "Add or Replace Controller FRUs" on page 162 for controller hardware installation procedures.

Rack Mount the Controller

The rack-mount hardware secures the controller to the rack. The mounting hardware is shipped with the controller.

MXe (Four-piece Bracket Installation)

1. Position a mounting bracket inside the rack frame at the desired height. Fasten the mounting bracket to the front of the rack frame with two screws—one in the top hole, the other in the bottom (see 1 on Figure 18). Then do the same to fasten the other mounting bracket on the other side of the rack frame at the same height.
2. Fasten the angle brackets on each side of the cabinet. Align the brackets with the pre-drilled holes located near the front panel. Use two screws to fasten each bracket (see 2 on Figure 18).
3. Set the controller cabinet onto the mounting brackets and slide the controller cabinet into the cabinet (see 3 on Figure 18).
4. Fasten the angle brackets to the rack frame. Install two screws in each bracket (see 4 on Figure 18).

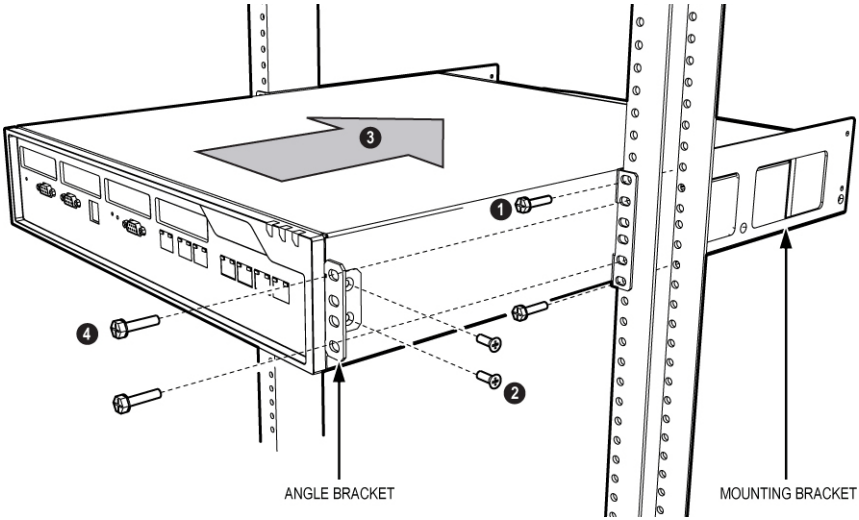

Figure 18: MXe and CX II/CXi II Controller Rack-Mount 4-Piece Bracket Installation

MXe (Two-piece Bracket Installation)

1. Attach the mounting brackets to the MXe using the flat head screws provided.
2. Loosely install one frame mounting screw on each side of the frame:
   - in the bottom hole position of the space that the MXe will occupy.
   - loosely enough that the frame mounting bracket can be dropped into position, resting on the screw thread (see Figure 19).
3. Position the MXe on the frame, resting the MXe mounting brackets on the frame mounting screw thread.
   - The MXe will rest on those screws while the remaining screws are installed.
4. Install two more screws on each side of the frame, in the 3rd and 6th hole positions.
5. Tighten all six of the mounting screws.

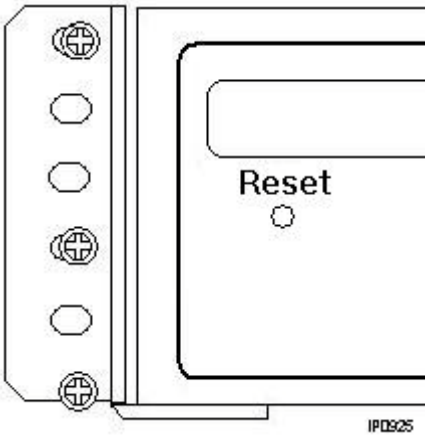

Figure 19: MXe Rack-mount Screw Placement (2-piece Bracket Installation)

CAUTION: Remove the MXe from the rack in reverse order. Loosen the bottom screws before the other screws are removed.
Never turn the bottom screws while the rack is resting on them.

AX

Tip: The AX controller must be rack-mounted. The chassis is shipped empty and is light enough to be installed by one person.

1. Mount the rack ears to the chassis front or rear facing, centre or face-mounted.
2. Attach the other part of the rack-mount kit to the rack.
3. Lift the chassis into the rack and bolt it in place.
4. Install power supplies, controller card, and line cards into the chassis.
5. Attach a permanent ground connection.

Tip: Refer to “Controller Card (AX)” on page 233 for installation instructions.

CX/CXi

1. Peel off the rubber bumper from one of the brackets. Removing the rubber bumper makes it easier to insert the controller into the rack.
2. Turn the cabinet over and place the bracket on the left side of the cabinet as shown in Figure 20. The farther you position the bracket back from the front of the cabinet, the farther the cabinet will protrude from the rack.
3. Place the plate over the bracket.
4. Insert the standoffs on the plate into the holes in the side of the bracket. Ensure that at least two of the standoffs are in holes on the bracket.
5. Fasten the plate securely to the cabinet with the two screws. Ensure that the bracket is locked into place.
6. Install the second bracket on the left side of the rack.
7. Turn the controller upright and slide into the rack.
8. Fasten the right bracket to the rack.

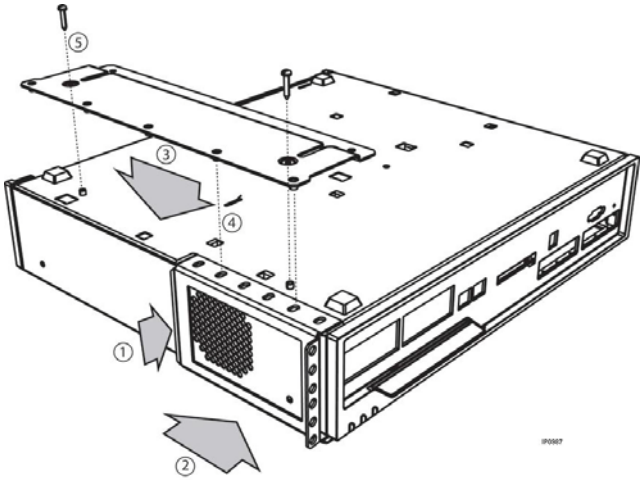

Figure 20: CX/CXi Controller Rack-Mount Bracket Installation

CX II and CXi II

1. Position a mounting bracket inside the rack frame at the desired height. Fasten the mounting bracket to the front of the rack frame with two screws—one in the top hole, the other in the bottom (see Figure 21). Then do the same to fasten the other mounting bracket on the other side of the rack frame at the same height.

Figure 21: CX II/CXi II Controller Rack-Mount Installation - Attaching Brackets to Rack Frame

2. Remove the cover from the controller.
3. Fasten the angle brackets on each side of the cabinet. Align the brackets with the pre-drilled holes located near the front panel. Use two screws to fasten each bracket (see Figure 22).

Figure 22: Figure 21: CX II/CXi II Controller Rack-Mount Installation - Attaching Brackets to Controller

4. Replace the cover on the controller.
5. Set the controller cabinet onto the mounting brackets and slide the controller cabinet into the cabinet.
6. Fasten the angle brackets to the rack frame. Install four screws in each bracket (see Figure 23).

Figure 23: CX II/CXi II Controller Rack-Mount Installation - Fastening Angle Brackets to Rack Frame

Wall Mount the CX/CXi and CX II/CXi II Controller

Required parts and tools:

- Wall mount bracket (supplied)
- Two #6 screws and washers (CX/CXi) (supplied)
- Two #4 metric screws (CX II/CXi II) (supplied)
- Drill, screwdriver(s), and two #10 screws for anchoring bracket to backer board.

CAUTION: Make sure the wall material is capable of supporting the weight of the unit. It is recommended that you mount the supplied bracket onto a backer board of 3/4" plywood that is securely fastened to the wall studs. DO NOT mount the bracket directly onto drywall (sheetrock). Mitel is not responsible for units damaged as a result of improper wall mounting.

CX/CXi

To wall mount the CX/CXi controller:

1. Turn the controller upside down.
2. Locate the two holes on the bottom of the Controller as shown Figure 24.
3. Assemble the two supplied screws and washers, then screw them into the holes on the bottom of the controller.
4. Mount the bracket onto the plywood backer board as follows:
   a. Pre-drill two pilot holes spaced 11.25" (28.58 cm) apart into the backer board.
   b. Orient the bracket over the two holes as shown below.
   c. Insert a screw into the hole on the left side of the bracket.
   d. Insert a screw into the hole on the slot on the right side of the bracket.
5. Secure the backer board to the wall studs.
6. Hang the controller onto the bracket as shown below.

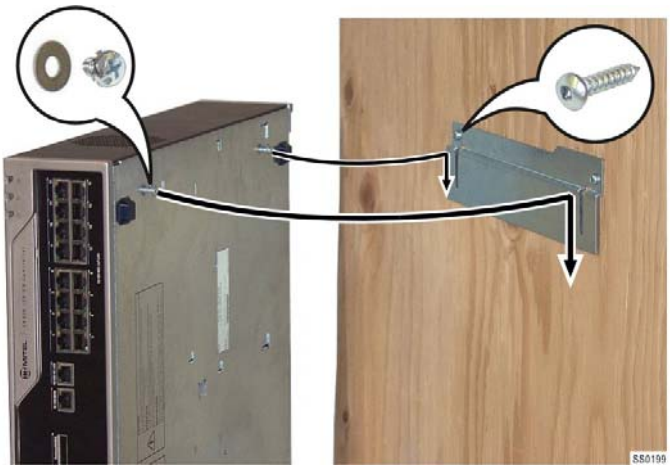

Figure 24: Wall-mounting the CX/CXi

CX II/CXi II

To wall mount the CX II/CXi II controller:

1. Turn the controller upside down.
2. Fasten the mounting bracket to the bottom on the controller using the supplied screws (see Figure 25).

Figure 25: Wall-mounting the CX II/CXi II - Attaching the Mounting Bracket to the Controller

3. Secure the backer board to the wall studs.
4. Pre-drill two pilot holes spaced 11.25" (28.58 cm) apart into the backer board.
5. Insert a screw into each pilot hole.
6. Hang the controller onto the screws.

Install Service Units and Cabinets

This section contains detailed information on installing and configuring the Network Services Unit and the Analog Services Unit for the 3300 ICP. This section also contains information on configuring embedded analog.

Tip: The MXe Server does not support Network Services Units, Analog Services Units, embedded trunking or embedded analog.

You can install any of the following Network Services Units (NSUs):

- Universal NSU (MSDN, PRI/QSIG, T1/D4)
- R2 NSU
- BRI NSU.

You can double the number of Universal and R2 NSUs in a system by chaining a secondary NSU to each primary NSU connected to the controller. BRI NSUs cannot be chained.

Some NSUs must be programmed with the ISDN Maintenance and Administration Tool (IMAT) (see “ISDN Maintenance and Administration Tool” on page 72).

CAUTION: To connect your NSU to the LAN, you must change the default IP and gateway addresses to match an available address on the LAN. The default address is 192.168.1.1:ffffff00. See "Program an IP Address into the NSU" on page 74.

Universal or R2 Network Services Unit

1. Mount and secure the NSU in the desired location.
2. Set the L0/L1 port DIP switches to the appropriate termination mode and impedance (see Table 37 on page 260 and Table 42 on page 262). The default is network termination mode. See “Network Services Units” on page 259 for the location of these switches.
3. Set the Message Link DIP switch to the appropriate position. See Figure 117 on page 259 for the location of the Message Link switch and Table 36 on page 260 for settings.
4. Connect a fiber optic cable between the NSU and the controller FIMs.
5. If you are installing a secondary NSU, connect a crossover CAT 5 cable between CIM 1 of the secondary NSU and CIM 2 of the primary NSU (see Table 39 on page 261 for CIM pinout, and Table 36 on page 260 for message link dip switch settings).
6. Connect the NSU L0 and/or L1 port to the remote system (the PSTN or another system). See Table 42 on page 262 for the pinout.
7. For the PRI and R2 protocols, program the NSU using IMAT (see “To install IMAT on the PC:” on page 73 and “Program NSU from IMAT” on page 75). Refer to the IMAT Online Help for more information.
8. Connect power to the NSU.

Tip: The NSU software will not load until the NSU programming is complete (see Step 9 below).

9. Using the System Administration Tool, program the NSU settings on the controller. In the **View Alphabetically** list, click **Network Services Unit Configuration**. Refer to the Online Help for more information.

Next: Install any other required services units. When all the services units are installed, go to "Install Telephones" on page 64.

BRI Network Services Unit

Connect the BRI NSU to the controller via a Universal E1 MSDN NSU. Refer to "Quad BRI Framer" on page 167 for installing embedded BRI.

Tip: Program the Universal E1 NSU before connecting the BRI NSU.

1. Mount the BRI NSU.
2. Connect the BRI NSU E1 ports to the Universal NSU L0/L1 ports (see Table 38 on page 260 and Table 42 on page 262 for pinouts).

   Tip: Use a CAT 5 cable between the BRI NSU E1 port and the Universal NSU that is running E1 DPNSS. Ensure that the pinout of the cable matches that of the E1 connector (pins 1, 2, 4 and 5 are connected). A 4-wire CAT 5 cable will only use pins 1, 2, 3, and 6.

3. Connect the BRI NSU to the ISDN devices using a 25-pair cable. See Table 44 on page 264 for the pinout.
4. Connect the BRI NSU to the maintenance PC:
   a. Connect the RS-232 port (RJ-45 connector) on the BRI NSU to a serial port on the PC.
   b. Set up the communications program on COM port 1 or 2 with the following parameters:
      - Baud Rate: **9600**
      - Data Bits: **8**
      - Parity: **None**
      - Stop Bits: **1**
      - Flow Control: **XON/XOFF**
      - Character Set: **ASCII**
5. Connect power to the BRI NSU.
6. On the PC, program the BRI NSU using a VT100 emulator (see TB #58004741, "Basic Setup Guide for the MC268 BRI card").

   Tip: Although the TB is written for the SX-2000 system, the parameters described are also applicable to the 3300 BRI NSU.

Analog Services Unit

This procedure applies to the ASU, the Universal ASU, and the ASU II (compatible only with Release 7.0 or later software). Ensure that there is a free CIM port on the controller.

ASU II mounting instructions:

- For rack mounting (rear or front facing), do not install the feet.
- For wall mounting, install only the two bottom feet.

All ASUs:

1. Mount the ASU. Refer to page 222 for ASU II line card installation instructions.
2. Connect a Crossover Category 5 cable with RJ-45 connector to the CIM port on the ASU and a free CIM port on the controller (see Table 39 on page 261).

Tip: The ASU can be located up to 30 meters (100 feet) away from the controller. The interface uses a single standard 8-pin modular jack consisting of 2 balanced signal pairs, and is located on the front of the unit.

3. Complete telephony cabling for the ASU (see Table 48 on page 268).
4. For the Universal ASU, complete the Music on Hold and Paging cabling if required. See Table 50 and Table 51 on page 270.
5. Connect power to the ASU. Once the CIM link synchronizes, the CIM LEDs turn on. The controller detects the ASU, and the application software downloads and starts immediately.
6. Using the System Administration Tool, program the ASU settings on the controller. Refer to the System Administration Tool Help for instructions.

Tip: The ONS circuits provide positive disconnect for support of applications such as door phones.

Tip: Use the LSMeasure Tool to determine the line settings for LS trunks on an Analog Board or a Universal ASU (refer to the System Administration Tool online Help).

Next: Install any other required services units. When all the services units are installed, go to “Install Telephones” on page 64.

Peripheral Cabinet, SUPERSET HUB, and Digital Service Unit

Tip: Refer to the Release 7.0 version of the Technician's Handbook for SX-2000 peripheral cabinet, SUPERSET HUB, and Digital Service Unit component installation instructions.

Installing SX-200 Bays

You can connect up to seven SX-200 Bays to the 3300 MXe controller using CIM or FIM cables. Only SX-200 ELx Bays equipped with BCC III controller cards and ONS, OPS and DNIC station circuits cards are supported. See Table 113 on page 383 for a list of supported cards. Supported peripheral devices are limited to the following:

- SUPERSET 4000-series DNIC telephones
- PKM 48, PKM 12 (attached using a SIM1 or SIM2)
- Analog Interface Module (AIM) connected to a SUPERSET 4025, 4125, or 4150
- SUPERCONSOLE 1000.

Note: SX-200 Bays are supported in North America only and use the same loss plan as 3300 ICP devices.

For more information about the SX-200 Bay, including detailed installation instructions and technical specifications, refer to the SX-200 ICP Technical Documentation available at http://edocs.mitel.com.

1. If replacing an SX-200 ICP controller, reallocate the facilities connected to the ONS, DNIC, LS trunk, MOH, Loudspeaker Paging, and other interfaces to equivalent interfaces on the 3300 ICP as required.

Note: The SX-200 ICP and 3300 MXe use different connector types for the Loudspeaker Paging and Alarm circuits. Rewiring will be required. See "Analog Board (CX/CXi, CX II/CXi II, and MXe Controllers)" on page 256 and "Controller Alarm Port Pinouts" on page 258 for cable connector pinouts and PLID assignments.

Note: The MXe provides two more alarm facilities (levels and relays) than the SX-200 ICP. As the installer, you will need to decide how to handle the alarms—for example, whether to connect the relays to bells or other alerting devices—and rewire your installation accordingly.

Note: The 3300 ICP lacks dedicated hardware and software support for the Door Opener facilities available on the SX-200 ICP. Equivalent functionality can be provisioned by using the loudspeaker paging feature and the associated paging relays on the AOB or AMB.

Note: The maintenance port on the SX-200 Bay is not required as all Bay programming and maintenance is done through the System Administration Tool on the 3300 MXe.

2. Remove all trunk interface cards and other unsupported cards from the SX-200 Bay.
3. Install the SX-200 Bay, including the Bay Power Supply, Bay Control Card, interface cards, Fiber or Copper Interface Module, and DSP Module (Single).

Note: The single DSP Module is required to support ONS CLASS/CLIP sets.

4. Complete the peripheral interface cabling. See Table 53 on page 272 for cable connector pinouts.

CIM Connection

5. Connect a Crossover Category 5 cable with RJ-45 connector to the CIM port on SX-200 Bay and a free CIM port on the controller (see Table 39 on page 261).

Tip: The SX-200 Bay can be located up to 30 meters (100 feet) away from the controller. The interface uses a single standard 8-pin modular jack consisting of 2 balanced signal pairs, and is located on the front of the BCC III card.

FIM Connection

6. Connect a fiber optic cable between the SX-200 Bay and the controller FIMs.

Note: The same variant of fiber interface module (820 nm multi-mode, 1300 nm multi-mode, or 1300 mn single-mode) must be at both ends.

Note: No other type of peripheral unit (NSU, DSU, etc.) can be connected to a Dual FIM module that is being used by a 200 Bay. The only type of unit allowed is another 200 Bay.

7. Power up the SX-200 Bay. Once the CIM or FIM link synchronizes, the CIM or FIM LEDs turn on. The controller detects the Bay and downloads firmware to it. After the download, the Bay is automatically started.

8. Using the System Administration Tool, program the SX-200 Bay settings on the controller. Refer to the System Administration Tool Help for instructions.

Install Telephones

This section contains information on installing telephone sets, consoles, and other peripherals.

The 3300 ICP supports a number of IP, DNI, analog and wireless phones, as well as conference units, programmable key modules, and attendant consoles. The CX/CXi and CX II/CXi II controllers only support IP and analog phones.

If you have a peripheral cabinet with analog/DNIC phones connected to it, program those telephones using the System Administration Tool.

Tip: You cannot use the Group Administration Tool to modify programming for SUPERSET 400-series telephones.

Install Telephones, Consoles and Appliances

Refer to each device's Installation Guide (included in the telephone package) to install the devices.

Note: Each IP Phone must be directly connected to an L2 switch port. DO NOT connect them in series (daisy-chaining) using the 2nd LAN port in the phone. If daisy chained, a problem with one phone can affect all the others in the chain. Also, all chained phones share the same bandwidth.

Note: If you intend to rely on LLDP VLAN Discovery in the network, you must first upgrade the 3300 ICP to Release 7.0 or later and upgrade the IP Phone firmware to version 2.0.0.18 or later.

Note: LLDP-MED non-compliant telephones cannot use LLDP for VLAN discovery. They must use DHCP VLAN discovery. Non-compliant sets are: 5001, 5005, 5010, 5020 IP Phones, 5140 IP Appliance, 5201, 5205, 5207, 5215 (single mode), 5220 (single mode), 5230 IP Phones, 5240 IP Appliance, 5485 IP Pager, and 5550 IP Console keypad.

IP phone firmware is automatically downloaded from the 3300 controller to the IP Phones (requires a DHCP server configured with options 128-133). You can also download firmware to the telephone by plugging it directly into an Ethernet port on the 3300 controller. The controller must be running Release 7.0 or later to provide LLDP-compliant firmware to the telephone.

Install Line Interface Modules

The Line Interface Module (LIM) provides analog operation to the 5220 IP Phone (Dual Mode), 5224 IP Phone, 5235 IP Phone, 5330 IP Phone, 5340 IP Phone, or 5360 IP in the event of an IP connection failure. Follow the instructions in the Installation Guide that is included in the module package to install a Line Interface Module. Refer to “Program Emergency Services for a Line Interface Module” in the System Administration Tool Help.

Install and Configure Music on Hold

There are three types of Music on Hold available to the system, embedded, analog, and digital. Program music on hold in the System Administration Tool. Refer to the online Help for instructions.

Note: The MXe Server supports embedded MOH only.

Embedded Music on Hold is provided by audio files that are imported into a single controller using the System Administration Tool or into multiple controllers using Enterprise Manager.

An Embedded Music on Hold (MOH) source in use consumes an E2T resource and each MOH session consumes an E2T resource.

Analog Music on Hold is provided by an external music source connected to any one of the following:

- Music on Hold connector (audio jack) on the back of a controller with embedded analog (see Table 27 on page 253)
- Music on Hold connector on the back of a Universal ASU (see Table 50 on page 269)
- Music on Hold connector on a peripheral cabinet E&M trunk card

Digital Music on Hold is provided by an external music source connected to a DNIC Music on Hold/Pager Unit (DMP). A peripheral cabinet is required. The DMP is connected to a DNI line card.

Installing a DNIC Music on Hold/Paging Unit (DMP)

Tip: To reduce the risk of hum or other interference, install the DMP close to the music source or paging amplifier and keep the cables to and from the unit as short as possible. If "none" balanced input or output equipment is used, you may need a balancing transformer (not supplied by Mitel).

To install DNIC Music on Hold (not supported on the AX, CX/CXi, CX II/CXi II, MXe, or SX-200 Bays):

1. Install a DNI line card in a peripheral card slot.
2. Attach the circuit tip and ring leads to the 25th pair of the DMP.
3. Attach the balanced music source to the 7th pair of the DMP via the MDF.

To install a DMP for Paging (not supported on the AX, CX/CXi, CX II/CXi II or MXe):

1. Install a DNI line card.
2. Attach the circuit tip and ring leads to the 25th pair of the DMP.
3. Attach the paging adapter interface to the 9th pair of the DMP.
4. If required, attach the page control inputs of the paging adapter via the MDF to the 11th and 12th pair of the DMP.
5. Connect the paging adapter to an appropriate power source (according to the manufacturer's instructions).
6. Connect the external speakers as required to the paging adapter via the MDF (according to the manufacturer's instructions).

Tip: Refer to the *3300 ICP Hardware Technical Reference Manual* for connector pinouts.

Program 5485 IP Paging Unit

Note: See Table 52 for the paging unit pinout and Figure 125 on page 271 for the cross connection wiring.

To program a 5485 IP Paging Unit (this programming procedure provides a burst of ringing prior to the speech broadcast):

1. Launch the System Administration Tool.
2. In the Multiline IP Sets form
   - Program the IP Paging Unit as "5010 IP".

- Enter the MAC address.

3. In the Feature Access Codes form (optional)
   - Assign a code to Direct Page Paging.
4. Multiline Set Keys form (optional)
   - Program a Paging key.
5. Interconnect Restriction Table
   - Ensure that the station is not restricted from Paging.

To program Group Page with the IP Paging Unit (This programming procedure does not provide a ring burst prior to the speech broadcast):

1. Multiline IP Sets form
   - Program the IP Paging Unit as "5010 IP".
   - Program the MAC address.
2. Page Groups form
   - Complete all required fields.Symbol Wireless Phones should not be programmed into paging groups.
3. Class of Service Options form
   - Set the Group Page Accept field to "Yes" for the IP Paging Unit.
   - Ensure that each telephone in the paging group has the Group Page Allow field set to "Yes".
4. Feature Access Codes form (optional)
   - Assign a Direct Page feature access code.
5. Multiline Set Keys form (optional)
   - Program a Paging key.
6. Interconnect Restriction Table
   - Ensure that the station is not restricted from Paging.

Register IP Devices from the Telephone

Use this procedure to register IP devices with the 3300 ICP database. The procedure will program the 3300 ICP database with the MAC address of the IP device.

Tip: Use the System Administration Tool to complete all other set programming (for example, Class of Service, Interconnect Restriction, Set Key Assignments, and Class of Restriction).

Before you begin

- Ensure a Set Registration Access Code and a Set Replacement Access Code are assigned in the System Options form.
- Ensure the directory number and device type is programmed in the Single Line IP Sets form or Multiline IP Sets form.

Register an IP Device

1. Connect the IP device to an RJ-45 Ethernet port on the LAN. For the CXi and CXi II, connect to a controller Ethernet port.
2. Provide power to the IP device (refer to the *3300 ICP Hardware Technical Reference Manual* at on Edocs (http://edocs.mitel.com) for power option information).
3. Press ***** during power-up (to clear any PIN number in memory).
4. Type the PIN number at the prompt on the IP device. Prompts are:
   - non-display IP Phones: solid message light.
   - display IP Phones and IP Appliances: display shows **Enter the PIN number**.

Tip: The PIN number is the set registration code followed by the set's extension number.

5. Complete one of the following to send the PIN:
   - 5001, 5005, 5201 and 5205 IP Phones: press **Hold**.
   - 5010, 5207, 5215, 5020, 5212, 5220, 5224, 5312, 5324, 5530 and 5340 IP Phones: press **SuperKey/Settings**.
   - 5140 and 5240 IP Appliances, 5235 IP Phone: press **OK**.
   - 5230 IP Appliance: press **Send**.

The set will complete initialization.

Register an IP Device in a Cluster

The registering sequence in a cluster is unchanged provided that:

- the Cluster Element ID programmed in the **Cluster Elements** form matches the ICP/PBX Number programmed in the **ICP/PBX Networking** form.
- each member of the cluster is programmed with the directory numbers of the other controllers. This information must be programmed using OPS Manager.

- the Set Registration Access Codes and Set Replacement Access Codes are the same for each controller in the cluster.
- each IP device is able to retrieve the IP address of one of the controllers in the cluster.

Program System

Programming Tools

The system includes a number of programming tools:

- **Embedded System Management (ESM)** consists of:
  - **System Administration Tool** that provides a Web-based interface that trained technicians use to program the system.
  - **Group Administration Tool** that provides a Web-based interface to enable administrators to make changes to user information.
  - **Desktop Tool** that provides a Web-based interface to enable display IP telephone users to program feature keys on their phone.
- **Mitel Integrated Configuration Wizard**, introduced in Release 7.0, assists you in the initial system programming. After you specify the system setup, you can save the configuration data for future use or apply the changes to the 3300 ICP. See the System Administration Tool online help for installation and configuration instructions.
- **ISDN Maintenance and Administration Tool** (**IMAT**) provides the programming interface for PRI and R2 protocols delivered via an NSU or DSU. Embedded PRI via the Dual T1/E1 Framer is programmed though the System Administration Tool.
- **MCD Software Installer Tool** expedites the distribution of 3300 ICP software by eliminating a number of interactive steps (see page 90). The tool restores saved databases from Release 6.1 and later. The Software Installer also enables databases from legacy SX-2000® LIGHT, SX-2000 MicroLIGHT, 3200 ICP, and 3800 WAG systems to migrate to the 3300 ICP. (You must use the Configuration Tool or the OPS Manager to create a database backup for the legacy systems before they can be restored using the Software Installer.) For current releases, the Software Installer replaces the Configuration Tool.
- **Configuration Tool** restores saved databases and enables legacy SX-2000® LIGHT, SX-2000 MicroLIGHT, 3200 ICP, and 3800 WAG systems to migrate to the 3300 ICP. (This is available for systems up to Rel 6.1 of the 3300 ICP.)
- **IP Phone Analyzer** collects performance information about the IP devices connected to the 3300 ICP. You can use one PC to monitor the debug and status information of IP phones (see page 73).

- **OPS Manager** enables you to control the maintenance and operation of a network of elements. With OPS Manager, you can, for example, manage a network telephone directory, schedule move, add, change, and delete user operations, and integrate the network telephone directory with a directory service database. OPS Manager is a part of the Enterprise Manager in Rel. 7.0 and higher. OPS Manager is required to support the resiliency features.
- **Mitel Standard Linux (MSL) Server Manager** on the APC allows you to administer the Teleworker Solution and Mobile Extension and to program and use software blades and services delivered from the Mitel Applications Management Center (AMC).

Log into the Programming Tools

Embedded System Management Tools

To log into one of the ESM tools:

1. Launch a browser and go to the URL of the 3300 Controller - https://<hostname>/main.htm
   - <hostname> is the name or IP address assigned to the Controller if no DNS is available. Refer to See “Establish Communication with Controller” on page 25.
   - When connecting to an MXe Server, you must use the System IP address (default 192.168.1.5) rather than the RTC IP address.
2. The first time you connect, you must install the Mitel Root CA security certificate (see “Secure Sockets Layer (SSL) and Security Certificate” on page 116).
3. To log into the 3300 ICP ESM:
   - Type the default **Login ID** (“system”) and **Password** (“password”).
   - Select **Remember Login ID** if you want to save the Login ID on your computer.
   - Click **Log In**.

Tip: To prevent unauthorized use, change the Login ID and password the first time you log in.

4. Click the desired Tool (Desktop, Group Administration, or System Administration).

5. You will be prompted to install some XML Components when you log into the System Administration Tool for the first time. At the following prompt, "Do you wish to install or upgrade the required XML components?", click "Install Now". The install takes less than 30 seconds and you do not need to restart your computer.

Tip: Your PC must have the same subnet address as the RTC IP (for example, 192.168.1.x) to launch the System Administration Tool. For the MXe Server, the PC must use the System IP address.

Tip: The system will allow up to 5 System Administration Tool users, 5 Group Administration Tool users, and 10 Desktop Tool users at one time.

Note: The System Administration Tool will temporarily lock you out for 15 minutes after three consecutive attempts to log in have failed.

Mitel Integrated Configuration Wizard

Install the Configuration Wizard on a maintenance PC that meets the following requirements:

- Windows 2000 or Windows XP Professional operating system
- JRE (Java Run-time Environment) 1.6.0_1 or later installed

To install the Configuration Wizard onto the maintenance PC:

- Close all applications running on the PC.
- Insert the 3300 ICP software CD-ROM into the CD drive.
- Open the **Tools** folder, then the **Configuration Wizard** folder.
- Double-click the MICW_2.x_Setup.exe file. Follow the prompts to install the program.

Note: You can also download the Configuration Wizard from Mitel Online.

ISDN Maintenance and Administration Tool

You can install IMAT on the Maintenance PC or on its own PC (IMAT PC).

Tip: We recommend using an Ethernet connection from the IMAT PC when running Windows NT 4.0, Windows 2000 Professional, Windows XP, or Windows 98. For Windows 95/98 (without a NIC), use Dial-up Networking.

To install IMAT on the PC:

1. Close all the applications running on the PC.
2. Insert the 3300 ICP software CD-ROM in the CD drive.
3. Open the **Tools** folder, then the **Disk 1** folder.
4. Double click the **Setup.exe** file. The installation program starts. Follow the prompts to install IMAT.
5. Connect the NSU Ethernet port directly to the NIC of the PC using a crossover cable or connect the NSU Ethernet port to the network.

Tip: Refer to the IMAT online help for LAN connection details. If you're using a dial-up connection, see “Installing System Software on the FTP Server” on page 105.

To launch IMAT on the Installation/Maintenance PC:

- On the **Start** menu, point to **Programs**, and click **IMAT**.

IP Phone Analyzer

To install the IP Phone Analyzer

- See page 125.

To launch the IP Phone Analyzer:

- On the **Start** menu, point to **Programs**, and click **Mitel IP Phone Analyzer** (see page 125 for details).

Mitel Standard Linux Server Manager

Before you can launch the MSL Server Manager, you must configure the 3300 ICP and APC to support MSL. For this procedure, refer to the 3300 ICP System Administration Tool Help.

Note: To launch the MSL Server Manager, you must know the IP address of the APC.

To launch the MSL Server Manager:

1. In an Internet browser window, go to the following URL: **https://**<IP address of APC>**/server-manager/**.
2. Enter the user name and password the MSL (as configured in the System Administration Tool).

For more information about MSL, refer to the Mitel Standard Linux documentation on Edocs (http://edocs.mitel.com).

Configure NSU via IMAT

The ISDN Maintenance and Administration Tool (IMAT) software is used to program PRI and R2 cards and Network Services Units. IMAT is also used to install PRI card and R2 card software.

Tip: IMAT is not applicable for the CX/CXi and CX II/CXi II controllers.

Tip: IMAT is not needed to program Embedded PRI, T1/D4, and QSIG (dual T1/E1 framer module or T1/E1 combo module in the controller).

Tip: You must use the latest release of the IMAT software. Refer to Table 18 on page 135 for information on the correct database version for the 3300 software load you are using.

Program an IP Address into the NSU

You must change the IP and gateway addresses to match an available address on the LAN.

Tip: If you have an MXe Server on the same network, you must change the NSU IP address because it will conflict with the default address of the MIPS IP on the MXe Server.

To program the IP address that IMAT will access:

1. Program the PC's serial port with a baud rate of **38400**.
2. Connect the IMAT PC to the NSU serial port.
3. Establish a terminal session with the NSU card.
4. Reboot the NSU.
5. Press any key during auto-boot to halt the boot process.
6. At the **[MC269AA Boot]-**: prompt enter **C**.
7. Change the boot parameters, **inet on ethernet (e) : 192.168.1.1:ffffff00** and for **gateway inet (g) : 192.168.1.251** default values to the values provided to you by your LAN administrator.

8. For all other settings, press ENTER to accept the default.

```
boot device          : flash
unit number          : 0
processor number     : 0
host name            : pc5147
file name            : vxworks
inet on ethernet (e) : 192.168.1.1:ffffff00
gateway inet (g)     : 192.168.1.251
ftp password (pw)    : vxworks
flags (f)            : 0x0
target name (tn)     : dass2
other (o): flash,c:/,xqt,b_loader.cmd
```

9. At [VXWorks Boot], type @, or press the **Reset** button on the controller.
10. Connect the NSU Ethernet port to the LAN.

Dial-up Connection of the IMAT PC to the NSU

For Windows 95 and Windows 98, refer to "Installing System Software on the FTP Server" on page 105.

For Windows 4.0, Windows 2000 Professional, or Windows XP without a NIC, refer to IMAT Online Help for Dial-up connection details.

Program NSU from IMAT

To log into IMAT

1. Launch IMAT from the **Start** menu or the desktop (ignore any message about username configuration error).
2. On the **File** menu, select **Connect to Remote Site**.
3. Click to select **Ethernet Network Card** in the Connection Medium field.
4. Refer to the IMAT online help for programming instructions.

To exit the IMAT application:

1. **Save** any open databases.
2. On the **File** menu, click **Exit**.

Tip: Refer to Appendix G for the following Windows 95/98 procedures: "Physically Connecting the PC to an NSU" on page 408, and "Creating a Dial-Up Network Connection on Windows 95/98" on page 408.

Program the Controller DHCP Server (MXe, CX/CXi, CX II/CXi II)

Note: DHCP options 128-133 used to configure Mitel IP endpoints have been reclassified as public options by the Internet Engineering Task Force (see RFC 2133 and RFC 3925). To comply with the change, Mitel recommends using either option 43 or 125, depending on the server's ability to support them and on administrator preference. (The embedded server supports both options with 125 as the factory-programmed default.) The old options can still be used to provide backward compatibility with IP sets that have yet to be upgraded with firmware that supports the new options. After the upgrade, the old options may be removed to prevent future conflicts with standard use or other vendors' use of these options.

Note: Ensure that all LLDP-compliant telephones are upgraded to firmware version 2.0.0.18 or later before you use LLDP on your network for VLAN Discovery.

Note: LLDP-MED non-compliant telephones cannot use LLDP for VLAN discovery. They must use DHCP VLAN discovery. Non-compliant sets are: 5001, 5005, 5010, 5020 IP Phones, 5140 IP Appliance, 5201, 5205, 5207, 5215 (single mode), 5220 (single mode), 5230 IP Phones, 5240 IP Appliance, 5485 IP Pager, and 5550 IP Console keypad.

Note: IP sets require a firmware upgrade to support the new DHCP options introduced in Release 7.0; otherwise, the sets will fail to boot. Such failures can occur, for example, in a resilient cluster of mixed software releases or when sets with old firmware are added to a controller after it was upgraded to Release 7.0. For the sets to boot, DHCP options 128-133 must be present in the DHCP server. After the sets have booted, options 128-133 may be removed to avoid future conflicts with standard use or other vendors' use of these options.

For additional information on programming DHCP settings for the 3300 ICP, refer to the System Administration Tool Online Help.

To use an external DHCP Server, do not enable the internal DHCP server and refer to “Configuring External DHCP Settings for E2T” on page 289 for instructions.

Tip: You may need to change the IP address of your PC to match your customer’s network.

1. On the Maintenance PC, access the System Administration Tool (see "Log into the Programming Tools" on page 71).
2. Select **View Alphabetically** in the view drop-down list.
3. Click **DHCP Subnet** form, enter the subnet name, IP address and bit mask.
4. In the **DHCP Static IP** form, enter a static IP address for the E2T using the information in Table 56 on page 283 (skip this step for the MX and 100-user controllers). Assign IP addresses to specific devices by using the MAC address of the device. Assign a static IP Address to any IP Console in a cluster.
5. In the **DHCP IP Address Range** form, program the scope using the information in Table 57 on page 284. Also see Table 54, “Reserved IP Addresses,” on page 277.
6. In the **DHCP Options** form, program the options listed in Table 58 on page 284 for the scope you just programmed. Always create the following options:
   - 3 Router, IP address
   - 125 Vendor-Identifying Vendor-Specific Information or Option 43 Vendor Specific Information. Option 125 is the preferred option
   - 66 TFTP Server, IP address format
   - 67 Boot file, string value (always /sysro/E2T8260)

   If there are 5230 IP Appliances, create the following options:
   - 6 DNS Server, IP address format
   - 44 NetBIOS Name Server, IP address format
7. In the **DHCP Lease Viewer** form, ensure that there is no DHCP IP Address Lease for the IP Console MAC Addresses. If there is, delete it and then power off and power on the device.
8. In the **DHCP Server** form, enable the internal DHCP server.

To use an alternative DHCP server:

1. In the **DHCP Server** form, disable the internal DHCP server.
2. Program your DHCP server with options 128-133.
3. Upgrade the IP Phones/ firmware to 2.0.0.18 or later.
4. Program your DHCP server with the following options:
   - 43 Vendor Specific Information, string value OR
   - 125 Vendor-Identifying Vendor-Specific Information, string value.
5. Delete options 128-133.

Program LS Trunk Settings via LS Measure Tool

Use the LS Measure tool in the System Administration Tool to program the line settings for Loop Start (LS) trunks that are connected to the AX Controller Card Chassis, Analog Main Board, Analog Option Board, or ASU II. The LS Measure Tool supports the following tests:

- Individual or Batch Line Quality Test
- Individual or Batch Distortion/Echo Test

The Line Quality Test allows you to obtain the optimum Balance Network Setting and Trunk Category for each LS trunk, based on the signals received from the CO. These settings are then programmed into the Analog Trunks form of the LS trunks to reduce the possibility of echo and audio level issues between the trunks and IP phones.

The Distortion/Echo test should only be run at the request of Mitel Technical Support.

Refer to the following book in the System Administration Tool online help for instructions: **Programming -> Programming Trunks -> Using the Line Measure Tool**.

LS Trunk Selection in the UK

Poor audio quality may be experienced if the incorrect subscriber line has been provided by the carrier.

To ensure that the correct lines are provisioned in the UK, the installer or system administrator should request that the Telco (e.g. BT), or carrier, provide trunks that are compatible to System X line type '0' (Subscriber lines) or line type '3' (business PBX/PABX lines).

Both types of lines will work satisfactorily with the 3300 ICP, however line type '3' is the preferred line type for connecting a PBX/PABX.

Configure Analog Music On Hold/Paging

The 3300 ICP supports

- Analog Music on Hold
- Digital Music on Hold (via a DMP)
- Embedded Music on Hold

Refer to the System Administration Tool online help for instructions on how to program Digital Music on Hold or Embedded Music on Hold.

To program Analog Music on Hold:

1. Launch the System Administration Tool
2. In the System Options form
   - Set the Music On Hold option to "Yes".
   - (Optional) Class of Service Options form.
3. In the E&M Trunk Circuit Descriptors form
   - Set the Outgoing Start Type parameter to "Immediate".
   - Set the Transmission Facility parameter to "2 wire".
   - Set the 2 Wire Balanced Network Setting parameter to "600".
   - Set “Perform Seize Test on Out-of-Service Trunks” to "No".
   - All other parameters may be any value.
4. In the E&M Trunk Assignments form
   - Ensure that the trunk number is unique. The service number, E&M trunk circuit descriptor number, and the interconnect number may be the same as other E&M trunks.
5. In the System Access Points form
   - Set "Music Source" to "External".
   - In the "Music Source Port - Location ID" field, enter the PLID of the E&M trunk circuit.

Note: Music on Hold can be assigned to either of the first two ports on a Universal ASU E&M card or to the E&M port on the Analog Main Board (AMB) (on a controller with embedded analog). Only one Music on Hold source is permitted per system.

6. If you assigned Music on Hold to an E&M port on the AMB (on a controller with embedded analog) reboot the controller to start Music on Hold operation. Or, if you assigned Music on Hold to a port on a Universal ASU E&M card, reload the Analog Services Unit to start Music on Hold operation.

Chapter 4

Software Installation

About Installing and Upgrading Software

You can install software manually or you can install it using the MCD Software Installer tool. **The software installation process** formats the hard drive and installs new software.

To upgrade the controller software or to install a software patch, you must use the latest release of the Software Installer. You can upgrade multiple controllers simultaneously over the LAN.

You can also perform remote upgrades and installations by connecting to the customer corporate LAN or through the 3300 ICP WAN port. Refer to "Getting Started" in the Software Installer Tool Online Help for details.

Tip: Before installing new software on the 3300 ICP, read the RN for the software you are installing (see "3300 ICP Documentation - Mitel eDocs" on page 8). Find out if any other software or firmware components of the 3300 ICP need to be upgraded to work with the new software.

CAUTION: If you decrease or increase the number of IP User Licenses, follow the instructions in Table 10 to avoid losing all your data.

Software Installation Requirements:

- ❒ Installation/Maintenance PC requirements (page 13)
- ❒ IP address of the 3300 ICP (System IP for the MXe Server; RTC IP for all other controllers)
- ❒ 3300 ICP username and password
- ❒ 3300 ICP software CD (or a copy of the 3300 ICP software)
- ❒ Mitel MCD Software Installer Tool (for a true upgrade)
- ❒ 3300 ICP Mitel Options Password (page 8)
- ❒ Database backup with voice mail messages (page 128)
- ❒ MXe Server only: If installing Mitel Standard Linux (MSL) and Mitel Communications Director, you must have the Mitel Communications Director Installation CD, and an external CD/DVD drive.

Tip: You need a new Options Password to change the purchased options or perform an upgrade for a major software release. You do not need a new password to change the configuration options.

Install System Software Manually

Note: This procedure applies to all platforms except the MXe Server. To install software on the MXe Server, see "Installing MSL Software on an MXe Server" on page 105.

Use this manual procedure to install software

- on systems with Release 3.3 software or earlier
- on systems that have no software installed on the hard drive
- when replacing a hard disk with one that has no software installed on it
- when replacing the flash card in an AX controller, or
- when upgrading software from Release 3.3 to any later release.

See Table 9 on page 100 for other scenarios that require manual software installation. In all other cases, we recommend that you use the MCD Software Installer.

Time: The complete manual install procedure takes approximately 2 hours for an average-sized database (50-100 MB) and approximately 4 hours for a large database (600 MB), including the database restore.

CAUTION: The software install procedure will format the controller hard drive and install new software. All system settings, including voice mail messages, will be erased so you must back up your database (page 128). If you do not have a database backup to restore, you will have to reprogram the system.

The manual upgrade/install procedure consists of the following steps, all of which **must be completed in order**:

Tip: Ensure that no one else makes changes to the database once you've backed it up. Any changes not included in your backup will be lost when the system is restored.

Tip: If a Security Information Warning pop-up window appears during this procedure, click **Yes** to continue.

Tip: You can connect directly to the controller through an Ethernet port. You can also connect to the controller through the LAN.

1. Back up the 3300 ICP database to the Installer PC (page 128).

CAUTION: If you have a Universal NSU with a PRI database, you may need to convert that database before you begin the upgrade. Refer to "Converting a PRI Database on a Universal NSU" on page 135 and the RN for conditions.

2. Install the software on the FTP Server (page 105).
3. Connect the maintenance PC to the controller (page 13).
4. Launch your VT100 emulator communications program.
5. Power up the controller.
6. Stop the controller from booting by responding to the prompt:
   - **Press** <SPACE><SPACE><SPACE> **to stop auto-boot AFTER countdown starts** (Release 5.2 and later)
   - **Press any key to stop auto-boot** (prior to Release 5.2).
7. At [VXWorks Boot], type **c**, and press ENTER.
8. For each setting shown in **bold** (Table 7 below), type the table value, then press ENTER. For all **other** settings, press ENTER to accept the default value.

Tip: The VXWorks parameters are case-sensitive.

Table 7: VxWorks Settings

Prompt	Value	Note
boot device	**qefcc** (CX(i) II and MXe III) —or— **motfcc** (all other controllers)	Boot device is Network. **Note:** The CX(i) II and MXe III accept motfcc but automatically convert it to qefcc on the next system reboot.
processor number	0	Not used.
host name	bootHost	
file name	**Boot_Install**	Boot location and file name.

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Table 7: VxWorks Settings (continued)

Prompt	Value	Note
inet on ethernet (e)		IP address and subnet mask (hex) for controller RTC (for example, 134.199.63.11:ffffff00). Obtain it from your IT administrator.
inet on backplane (b)		
host inet (h)		IP address of FTP Server. Used for software upgrades.
gateway inet (g)		IP address of the end user's default gateway for the 3300 ICP (must be outside the DHCP range).
user (u)	ftp	User name of FTP Server.
ftp password (ftp)	ftp	Password of FTP Server.
flags (f)	0x0	Uses host inet IP address.
target name (n)		
startup script (s)		
other (o)	FixPartition	Used to partition a hard drive or AX flash card that has no system software on it. **Note:** If the hard disk comes without software, you **must** use "FixPartition" to partition the hard disk for the install. **Note**: During the installation process, the system automatically changes this parameter to qefcc (CX(i) II and MXe III) or motfcc (all other controllers).
		Page 2 of 2

9. At [VXWorks Boot], type @, or press the controller **Reset** button.

Time: The system takes approximately 30 minutes to format the hard drive and install the software.

10. If you have an E2T card, do the following:

- Launch Internet Explorer and type the IP address of the controller (for example, http://<RTC IP address>). Log into the 3300 ICP ESM using the default username (**system**) and password (**password**).

Tips:

- The Installer PC must have the same subnet address as the RTC IP (for example, 192.168.1.n) to launch ESM.
- If login fails or you experience difficulty excuting maintenace commands, it may be because the system is not finished loading. Wait a few minutes and try logging in again.
- If you enter an incorrect username/password three times in a row, the system will prevent you from attempting to log in with this username/password for a period of 15 minutes.

- Enter the **UPGRADEBOOTROM E2T** command.

11. Complete the installation using the **System Administration Tool** (see Step 12) or the **Software Installer Tool** (see "Install System Software using the Software Installer" on page 90).

12. PING the controller to verify that you have established a connection.

13. Set the options in the **License and Option Selection** form according to your purchased Mitel options. Refer to your records or go to the AMC (page 29).

Tip: Since the installation of new software erases all of your system settings, you must complete this form even if you have not purchased any new options.

a. Access the Software Administration Tool.

a. Select **View Alphabetically** in the view drop-down list.

b. Click **License and Option Selection**. Click **Change** in the top left corner.

c. Enter the information for the system options you purchased.

d. Enter your Mitel Options Password in the **Password** field.

e. Change the **Configuration options** as needed.

Tip: We recommend that you enable **Networking Option** and **Mitai/Tapi Computer Integration**.

f. Click **Save**. A pop-up window instructs you to restore or reboot. Click **OK** to close the window.

14. Restore the database backup (page 130). Not all steps are required.
15. If you do not have a database backup:
    - **Reset** the controller (page 127).
    - Access the System Administration Tool.
    - In the **View Alphabetically** list, click **Maintenance Commands**.
    - Issue the **dbms save** maintenance command.
    - Enter the **dbms stat** command to verify the DBMS save, and that the **DBMS_Initialized** flag is on.

Tip: Complete the following Maintenance Checks only after a restore.

CAUTION: Do not reset system components while executing the following checks.

16. Verify that none of the NSUs are loading. If they are, wait until they have finished loading (L0/L1 LEDs stop flashing).
17. When the system has finished resetting, log back into ESM.
18. In the **View Alphabetically** list, click **Maintenance Commands**.
19. Enter the **dbms stat** command to verify the DBMS save, and that the **DBMS_Initialized** flag is on.
20. Issue the **Type *.dr.logfile_1** command to display the log file created during the Data Restore. When the checks are complete, review the log to ensure there were no errors during the restore procedure.
21. Issue the **mess sub** command to check the programmed NSU links; they should be OPEN. If any programmed links are in SCAN, check the LINK STATUS LEDs; if the amber LEDs are flashing, this means that the NSUs are writing to the RAM DISK.
22. Upgrade the IP telephones and force lease renewals. Issue the **LOAD IPDevice 1 to X** maintenance command (where X represents the last IP device number) to upgrade the IP phones.
23. If the system has a peripheral cabinet with DNI line cards, enter the **Load x x x** command to load the DNI cards and the latest DNI line load.

Tip: If you have an IP console, you must:

- Cycle the power on the IP TKB (key pad).
- Upgrade the IP Console software (if required).
- Renew the IP address for the console PC (if required).
  Power down or at the DOS prompt enter **ipconfig /release** and then **ipconfig /renew**.

24. Back up the database (page 128).

The MCD Software Installer Tool

Install the MCD Software Installer Tool

You can install the MCD Software Installer Tool on the Installation/Maintenance PC, or on its own PC (see page 13 for PC requirements).

Tip: Assign a static IP address to the PC running the Software Installer.

Tip: Ports required by the Software Installer:
Prior to Release 7.0 - port 2002 and ports 49500-49549
Release 7.0 and later - port 443.

To install the Software Installer:

1. Insert the MCD software CD-ROM disk 1 (R8.0 or earlier) or disk 2 (R9.0 or later) into the Installer PC's CD drive.
2. Open the **Tools** folder, then the **Mitel Communications Director Software Installer** folder.
3. Double-click the **MCDSoftwareInstallerSetup.exe** file. Follow the prompts to install the Software Installer.

To launch the Software Installer:

- On the **Start** menu, point to **Programs**, and then click **MCD Software Installer**.

Tip: Refer to "Enable Licenses and Options" on page 29 to manage software licenses online.

Install System Software using the Software Installer

CAUTION: If you have a Universal NSU with a PRI database, you must convert that database before you begin the install (see "Converting a PRI Database on a Universal NSU" on page 135).

To perform a full or new install with the Software Installer:

1. Launch the Software Installer.
2. Choose:
   - **3300 ICP** to install software on a 3300 ICP, or
   - **MXe Server** to install software on the MXe Server
   - Click **Next**.
3. In the **SI Login** screen, complete the fields:
   - For the 3300 ICP:
     System Login ID
     System Password
     3300 ICP System IP Address
   - For the MXe Server:
     APC-MXe IP Address
     APC Login ID (Linux administrator login ID)
     APC Password (Linux administrator password)
     System Login ID
     System Password
4. Click **Configure**.
5. If you chose 3300 ICP:
   - Select **Perform Full Install**
   - Click **Offline** or **Online**

   If you chose MXe Server:
   - Click on **License and Restore**

Tip: If you are installing Rel 8.0+ onto a Rel 8.0 or Rel 8.0+ software load, you do not need to install from an external FTP server.

6. If you are using the 3300's internal FTP server, type in or browse to the location of the upgrade load.

   Otherwise, enter
   - FTP Server IP Address
   - FTP Account Name
   - FTP Password
7. Click **Next**.
8. Select the desired install options.

9. Click **Next**.

10. In the **License and Option Selection** screen, enter the **ARID** (Application Record ID) and click on **Retrieve Licenses**.

    If you chose 3300 ICP, you will be able to manually enter some of the license options if you wish.

    If you chose MXe Server, you will not be able to enter any of the licenses. Clicking Retrieve Licenses will attempt to fill in the license options.

    - If licenses exist, the screen will be filled in with all of the licenses and options.
    - If licenses do not exist, the Software Installer will try to connect to the AMC to get licenses.
    - If licenses do not exist and the AMC is unreachable, then:
      - The Software Installer will create a batch file that contains the options, and
      - You can reconnect to the Software Installer later to run the batch file to license the options.

Tip: You will not be able to continue with the installation until the licenses have been obtained.

11. Once the licenses have been obtained, click **Next**.

12. Click **Start** on the Installation In Progress screen to begin the installation.

Time: This process takes approximately 45 minutes.

Upgrade System Software

The following conditions apply to both online and offline upgrades:

- You will not be able to use the System Administration Tool until the upgrade is complete or until you cancel the upgrade using the Software Installer.
- You will not be able to perform backups until the upgrade is complete and the activation has been done.
- The upgrade requires a change to a different set of DHCP options (43/60 or 124/125) used to configure Mitel IP endpoints. The change is due to reclassification of DHCP options by the Internet Engineering Task Force (see RFC 2133 and RFC 3925). The old options can still be used to provide backward compatibility with IP sets that have yet to be upgraded with firmware that supports the new options. After the upgrade, the old options may be removed to prevent future conflicts with standard use or other vendors' use of these options. The change to the new options is automatic for the internal DHCP server.
- LLDP-MED non-compliant telephones cannot use LLDP for VLAN discovery. They must use DHCP VLAN discovery. Non-compliant sets are: 5001, 5005, 5010, 5020 IP Phones, 5140 IP Appliance, 5201, 5205, 5207, 5215 (single mode), 5220 (single mode), 5230 IP Phones, 5240 IP Appliance, 5485 IP Pager, and 5550 IP Console keypad.

Online Upgrade

Note: You can use online upgrade **only** when upgrading from Rel 8.0 to a later release. In this case, you can also use the internal FTP server.

Online Upgrade is the default upgrade method for Rel 8.0 and later. Performing an Online Upgrade means scheduling very little down time for your upgrade. You can perform most of your upgrade with the system running. The only downtime will be during the reboot.

In addition, you can do the entire install, and then schedule the reboot whenever it is convenient. You can close the Software Installer anytime after the Installer has finished transferring the new files to the 3300. See Table 8 for more information about closing the Software Installer before the upgrade is complete.

1. Launch the Software Installer.
2. Choose **3300 ICP** or **MXe Server** and click **Next**.

3. The **SI Login Screen** will appear. Complete the login and IP addresses, and click **Configure**.
4. The Upgrade Screen appears. Click **Perform Upgrade**. Leave the **Offline** check box unchecked.
5. Enter path (or **Browse**) to the 3300 ICP software.
6. Click **Next**. Select the desired upgrade options.

CAUTION: If you choose "transfer resilient devices immediately" active calls will be terminated.

Tip: While Data Preservation and Software Activation are in progress, no database changes will be permitted. No changes will be saved from the time the Backup starts. This includes changes made from the System Administration Tool, Enterprise Manager and Desktop Tools.

7. In the **License and Option Selection** screen, enter the **ARID** (Application Record ID) and click on **Retrieve Licenses**.

   If you chose 3300 ICP, you will be able to manually enter some of the license options if you wish.

   If you chose MXe Server, you will not be able to enter any of the licenses manually. Clicking **Retrieve Licenses** will attempt to fill in the license options.

   - If licenses exist, the screen will be filled in with all of the licenses and options.
   - If licenses do not exist, the Software Installer tool will try to connect to the AMC to get the licenses.
   - If licenses do not exist and the AMC is unreachable, then the SI will create a batch file that will allow you to license the controller later, after you are able to contact the AMC.

   Click **Next**.

Tip: You will not be able to continue with the installation until the licenses have been obtained.

8. Click **Start** on the Upgrade In Progress screen.
9. If you didn't schedule software activation, you must activate the new software when the installation is complete. Refer to "Complete Online Upgrade – Software Activation" on page 96.

Cancel or Close an Online Upgrade

You can cancel your online upgrade at any time without affecting system users. The upgrade is terminated either immediately or after completion of the current step.

Table 8 lists the impact of closing the Software Installer during an upgrade. Depending on when you close the Software Installer, you may be able to resume where you left off by reconnecting later. See “Resume an Online Upgrade” on page 96.

Table 8: Closing the SI before Upgrade is complete

Software Installer is closed...	What happens to the upgrade in progress?
... prior to starting Upgrade	No record of user input will be saved. You will have to re-enter all the options when you log in to the Software Installer again.
... during software file transfer (while performing the ftp push)	During the software transfer portion of the upgrade, the 3300 will request that the 3300 send individual files to the hard drive. When the file transfer is complete, the 3300 will begin unzipping and extracting each file. If the SI is closed prior to completing the file transfer, the 3300 will remain in a file request state. The upgrade will not finish because not all of the files have been transferred to the 3300.
... while the 3300 is extracting the software files	The extraction is not complete. The upgrade will not finish because not all of the files have been transferred to the 3300.

... following the file transfer	If the user has chosen the option that causes **Software Activation** Immediately after the file transfer is complete or a **Software Activation** time has been set, then
	- The upgrade will finish.
	
	If the user has chosen to delay the **Software Activation**, but has not specified a time for it to run, then
	- The upgrade will not finish.

... during the internal Backup	The 3300 will control the internal backup and all subsequent steps. The upgrade will finish.
	Page 1 of 2

Table 8: Closing the SI before Upgrade is complete (continued)

Software Installer is closed...	What happens to the upgrade in progress?
... during the License Configuration	The 3300 already has all the information it needs to continue. The upgrade will finish.
... during the internal Restore	The 3300 will control the internal restore and all subsequent steps. The upgrade will finish.
... during the activation of the new load (Swap and system reset)	The 3300 has all the information it needs to complete the upgrade process. The upgrade will finish.
	Page 2 of 2

Resume an Online Upgrade

1. Launch the Software Installer.
2. Login and connect to the 3300. If the SI determines that an upgrade is in progress on the 3300, it will display the In Progress screen.
3. Click on **Resume Upgrade**.

CAUTION: If you have scheduled an immediate Software Activation, your controller will automatically reboot when the upgrade is complete.

Tip: If you click on **Cancel** instead, the upgrade will stop and the status file will be removed from the controller. You will start from the beginning again the next time you launch the Software Installer.

Complete Online Upgrade – Software Activation

Activate the new software when traffic is lowest, and the reboot will have the minimum impact. Reconnect the controller to the Software Installer. Click **Start Software Activation**.

After the upgrade, follow the instructions in "Reprogram external DHCP servers (required for Release 7.0)" on page 99 to reprogram the DHCP server(s) to use the new DHCP options.

Offline Upgrade

Follow the steps as specified by the Software Installer. Your system will be unavailable during the course of the upgrade.

Time: This process will take approximately 1 to 2 hours including the backup, restore, and reboot.

1. Install system software on the FTP server (page 105).
2. Launch the Software Installer.
3. Choose **3300 ICP**, and click **Next**.
4. The SI Login Screen will appear. Complete the fields to login and click **Configure**.
5. Select **Perform Upgrade** and click the **Offline** check box. Type in or browse to the location of the upgrade files. If you are using an external FTP Server, enter
   - FTP Server IP Address
   - FTP Account Name
   - FTP Password

   Click **Next**.
6. Select the desired upgrade options. Click **Next.**
7. In the **License and Option Selection** screen, enter the **ARID** (Application Record ID) and click on **Retrieve Licenses**.

   If you chose 3300 ICP, you will be able to manually enter some of the license options if you wish.

   If you chose MXe Server, you will not be able to enter any of the licenses manually. Clicking **Retrieve Licenses** will attempt to fill in the license options.
   - If licenses exist, the screen will be filled in with all of the licenses and options.
   - If licenses do not exist, the Software Installer will look for a license batch file. If a batch file does not exist, the SI will try to connect to the AMC to get the licenses.
   - If licenses do not exist and the AMC is unreachable, then the SI will create a batch file that will allow you to license the controller later, after you are able to contact the AMC.

Click **Next**.

Tip: You will not be able to continue with the installation until the licenses have been obtained.

8. Click **Start** on the In Progress screen.
9. After you upgrade a controller in a resilient cluster, you must clear your PC's browser cache (page 135) and distribute new firmware to all IP Phones (page 110) when the Software Installer completes the upgrade.

Tip: After you upgrade the 3300 ICP software, you must reboot the 3300 CITELlink Gateway in order for the gateway to load the new software.

Tip: If the system includes IP DECT wireless phones, reboot each Open Mobility Manager (OMM) in the IP DECT system after the upgrade. Refer to the IP DECT Technical Manual for instructions. When you reboot the OMMs, the Radio Fixed Parts (RFPs) will obtain the latest firmware (iprfp.bin file) from the 3300 ICP controller.

10. After the upgrade, reprogram the DHCP server(s) to use the new DHCP options. See "Program the DHCP server (internal or external, Release 7.0 and later)" on page 98 or "Reprogram external DHCP servers (required for Release 7.0)" on page 99.
11. Access the ESM and use the maintenance command WRITEDATETIME to set the controller date and time.

Program the DHCP server (internal or external, Release 7.0 and later)

Note: The MXe Server does not have an internal DHCP server.

1. Check the **DHCP Options** form for previously programmed options 128 - 133 values. Ensure that the values have been correctly converted to Option 125 for all defined scopes in the DHCP server(s) of all upgraded controllers.

Note: DO NOT delete Options 128-133 yet.

2. After the upgraded controllers are returned to service, and all IP Phones have re-homed to them, use the LOAD IP 1-700 maintenance command to force a firmware reload of all devices.
3. Delete old options 128-133 on all controllers.

Reprogram external DHCP servers (required for Release 7.0)

Note: If you intend to rely on LLDP VLAN Discovery in the network, you must first upgrade the 3300 ICP to Release 7.0 or later and upgrade the IP Phone firmware to version 2.0.0.18 or later.

Note: LLDP-MED non-compliant telephones cannot use LLDP for VLAN discovery. They must use DHCP VLAN discovery. Non-compliant sets are: 5001, 5005, 5010, 5020 IP Phones, 5140 IP Appliance, 5201, 5205, 5207, 5215 (single mode), 5220 (single mode), 5230 IP Phones, 5240 IP Appliance, 5485 IP Pager, and 5550 IP Console keypad.

1. Use option pairs 60/43 or 124/125, whichever is most appropriate for the customer's environment.
2. Ensure that previously programmed options 128-133 values are in place for the global scope and any defined sub-scopes in the DHCP server(s).

Note: DO NOT delete Options 128-133 yet.

3. Ensure that the TFTP server pointed to by option 128 corresponds to a server (possibly an upgraded ICP) that contains the new IP Phone software loads.
4. On the DHCP server(s), create a global scope corresponding to option 60 or option 124 (as selected above). Repeat for each sub-scope (if any).
5. On DHCP server(s) define option 43 or option 125 (as selected above) for each newly created scope. See the 3300 System Administration Tool Help for information on formatting the required option strings.

Note: The values used in the option 43 string must correspond exactly to previous option 128-133 values.

6. After the upgraded controllers are returned to service, and all IP Phones have re-homed to them, use the LOAD IP 1-700 maintenance command to force a firmware reload of all devices.
7. Delete old options 128-133 on all DCHP servers.

System Software Installation Details

Software Upgrade/Install Options

Table 9: 3300 ICP Upgrade/Install Options

Upgrade Path	Procedure	Online or Offline?	FTP Server
From 3.2 or 3.3 to any later release	Manual install only	Offline	External
From 4.0 or 5.x to any later release	Software Installer and full install	Offline	External
6.0 or 6.1 to 7.0.8.4	Software Installer and upgrade	Offline	External
7.0 and 7.0 UR1 to 7.0 UR2, 7.1	Software Installer and upgrade - Programming for an ASU II will be discarded; purchase ONS licenses and reprogram.	Offline	External
From 7.1 and earlier to 8.0 or later	Software Installer and full install or upgrade	Offline	External
From 8.0 to 8.0+[2, 3]	Software Installer and full install or upgrade	Online or Offline	Internal or External
To MCD 4.1[4]	Software Installer and full install or upgrade	Online or Offline	External
Advance replacement hard drive	Manual install only	Offline	External
Rebuild/replace corrupt database	Manual install only	Offline	External
Change hard drive across platforms	Manual install only	Offline	External
Upgrade to a larger controller or faster processor (e.g. CX to MX)	Replace the controller - move the hard drive, manually install software, then use the Software Installer.	Offline	External

Table 9: 3300 ICP Upgrade/Install Options

Upgrade Path	Procedure	Online or Offline?	FTP Server
Note 1: See “Downgrading to a Previous Software Release” on page 112 for a downgrade restrictions table. **Note 2:** To use online upgrade to move to Release 8.0+ software, the controller must have a hard drive (minimum 40 GB) installed. You must also have a minimum of 512 MB of RAM in your system. If you are upgrading an AX, it must have the extra Flash installed. **Note 3:** To upgrade the MXe Server to 3300 ICP Release 9.0, follow the procedure, "Upgrade the 3300 ICP software on the MXe Server" on page 106. **Note 4:** The only direct upgrade path to MCD 4.1 is from MCD 4.0 with "Telephone Directory (TelDir) Synchronization via SDS" enabled. Systems running older software must upgrade to MCD 4.0 and enable TelDir Synch before upgrading to 4.1. Systems running 4.0 and using OPS Manager for TelDir Synch can upgrade to 4.1 after following the migration procedure described in Knowledge Base article 09-3070-00008, "Migrating to RDN Synchronization via SDS."			

Upgrading System Software - Notes

Note: MXe Server only: If you need to reinstall the operating system, refer to the procedure in “Recover MXe Server” on page 143. To upgrade the 3300 ICP software, follow the procedure "Upgrade the 3300 ICP software on the MXe Server" on page 106.

CAUTION: If you have a Universal NSU with a PRI database, you may need to convert that database before you begin the upgrade. Refer to page 135 and the Release Notes for conditions.

Tip: To minimize the size of the database, you may want to ask your users to delete any unneeded voice mail messages.

Tip: Refer to “Downgrading to a Previous Software Release” on page 112 for a downgrade restrictions table.

CAUTION: PC or Layer 2 switch connection must be to Ethernet port 1.

Change Number of IP User Licenses

If you need to decrease or increase the number of IP User Licenses during the software installation, perform the following steps to avoid losing all data at reboot.

Table 10: Changing the Number of IP User Licenses

If you are increasing or decreasing the number of IPUser Licenses	You MUST do the following:
AND the Maximum Configurable IP Users and Devices parameter is **NOT** modified	- save the change - perform **DBMS Save** command
AND the Maximum Configurable IP Users and Devices parameter **IS** modified	- save the change - perform **DBMS Save** command - perform a backup and restore
Note: The Maximum Configurable IP Users and Devices parameter is only modified when you are increasing the number of IP User Licenses over 700.	

Cluster or Dimension Changes

There are install/upgrade requirements to consider when dealing with Maximum Elements per Cluster changes or Dimension Selection changes.

Tip: Print a record of the Flex Dimension in case you have to re-program the Flex Dimension.

Table 11: Maximum Elements Change or Flexed Dimension Selection

Elements / Dimensions		MCD Software Installer	Notes
From	To		
Prior to Rel 6.0 with Flexed Dimensions	Release 6.0 with Flexed Dimensions	Install only. Do not perform a data restore with the Software Installer. See "Upgrade to Rel 6.0 or later with Flexed Dimensions" on page 108.	After the install is complete, flex the dimensions, reboot, and restore using current dimension selections.
			Page 1 of 2

Table 11: Maximum Elements Change or Flexed Dimension Selection (continued)

Elements / Dimensions		MCD Software Installer	Notes
From	To		
30 or 60 / Flexed Dimension Selection	30 or 60 / Flexed Dimension Selection	Install or Upgrade	Use Dimension Selections from the backup file.
30 or 60 / default or Flexed Dimension Selection	250 or 999 / default	Install See “To upgrade and change to a default dimension:” on page 107.	Use the existing Dimension Selections. If changing from Flexed Dimensions, it is possible that data may be lost.
30 or 60 / Flexed Dimension Selection	250 or 999 / Flexed Dimension Selection	Install only. Do not perform a data restore with the Software Installer. See “To upgrade and change to a flexed dimension:” on page 107.	After the Install and Maximum Element selection, Flex Dimensions, Reboot, and Restore through ESM. Use the existing Dimension Selections.
250 or 999 / default	30 or 60 / default	Install See “To upgrade and change to a default dimension:” on page 107.	Use the existing Dimension Selections. It is likely that data will be lost when going from a large database to a smaller one.
250 or 999 / default	30 or 60 / Flexed Dimension Selection	Install only. Do not perform a data restore with the Software Installer. See “To upgrade and change to a flexed dimension:” on page 107.	Install, select Maximum Elements, Flex Dimensions, Reboot, and then Restore using ESM. Use the existing Dimension Selections. Data may be lost when going from a large database to a smaller one.
			Page 2 of 2

Tip: The system software ships with small system dimensions enabled. You enable the large network cluster when you select 250 or 999 Maximum Elements per Cluster in the License and Option Selection form. The Default Feature Resources Dimension changes from Dimension 17 to Dimension 19.

Installing MSL Software on APC (CX/CXi) or APC-CX(i) II (CX II/CXi II)

Use this procedure to install Mitel Standard Linux (MSL) software on a replacement Application Processor Card (APC-CX(i)) or APC-CX(i) II assembly hard drive. When you purchase the APC-CX(i) or APC-CX(i) II with its hard drive, the (MSL) software is already installed on the hard drive.

Refer to pages 191 and 198 and for instructions to install the replacement hard drive.

To install the MSL software on an APC (CX/CXi):

1. Insert the MSL software CD into a portable CD-ROM drive attached to a USB connector located on the front panel of the 3300 ICP.
2. Power down the 3300 ICP controller (page 127).
3. Power up the 3300 ICP controller.
4. Launch the secure telnet client.
   - Enter open <RTC IP address> using port <2005> (command with example IP address, **open 192.168.1.2 2005**).
   - Enter the 3300 username and password.
5. Follow the on-screen instructions to configure the MSL. Refer to the "Mitel Standard Linux Installation and Administration Guide" on Edocs (http://edocs.mitel.com).

To install the MSL software on an APC-CX(i) II (CX II/CXi II):

1. Insert the MSL software CD into a portable USB CD-ROM drive attached to a USB connector on the APC-CX(i) II assembly (at the rear of the controller, next to the VGA connector).
2. Connect a serial cable to the RS-232 port on the APC-CX(i) II assembly.
3. Launch a serial terminal emulator such as HyperTerminal or NetTERM. Configure it for 38400bps, 8 bits, no parity, 1 stop bit (8n1).
4. Power down the 3300 ICP controller; see page 127.
5. Power up the 3300 ICP controller.
6. Follow the on-screen instructions on the serial terminal to install and configure MSL. Refer to the "Mitel Standard Linux Installation and Administration Guide" on Edocs (http://edocs.mitel.com).

Installing MSL Software on an MXe Server

Use this procedure to install Mitel Standard Linux (MSL) software on a replacement hard drive for an MXe Server with two hard drives.

Refer to page 213 for instructions to install the replacement hard drive.

To install the MSL software on an MXe Server

1. Insert the MSL software CD in the CD-ROM drive. Ensure that your system will boot from the CD.
2. Reboot the computer. The installation script runs automatically and the MSL Installer dialog appears.
3. Follow the on-screen instructions to install and configure the MSL. Refer to the “Mitel Standard Linux Installation and Administration Guide” on Edocs (http://edocs.mitel.com).

Installing System Software on the FTP Server

Tip: If you are installing Rel 8.0+ software onto a Rel 8.0 or Rel 8.0+ load, you don’t need to install from an external FTP server.

To install system software on the FTP server:

1. Insert the 3300 ICP software CD-ROM into the installer PC’s CD drive.
2. Release 7.0 and later: run the **Mitel_3300ICP_Installation.exe** program from the Software folder on the software CD-ROM.
   Prior to Release 7.0: run the **Setup.exe** program from the Software folder on the software CD-ROM.

   You will see the Installation Wizard Welcome page.
3. Click **Next**, read the License Agreement, and click **Yes** to continue.
4. Choose a location on your local FTP server for the InstallSetup program to install files (default username and password for the controller are ftp and @).

   - Click **Browse** to find the location, and then click **Next**

   OR

   - Click **Next** to accept the location displayed and continue.

   You will see a read-only list of the configurations you have made.

Tip: If you do not see this list, your FTP server is not installed properly. Re-install your FTP server.

5. Click **Next**.

Tip: If the install files get installed on the PC's **c:** drive, it means that your FTP server is not installed and you will get a message "No FTP Server". Re-install your FTP server.

Time: The system takes approximately 10 minutes to copy the files.

6. Ensure that the **Read manual instructions to complete the installation** check box is selected, and click **Finish**. The README file opens.

Note: Every time you install system software on the FTP server, a new file is added to the administrator's PC. To avoid filling up your hard drive, select **My Computer > Add or Remove Programs** and delete older files.

Upgrade the 3300 ICP software on the MXe Server

Upgrading the 3300 ICP software on the MXe Server sometimes also requires upgrading MSL—for example, when upgrading to 3300 ICP, Release 9.0. To find out whether you need to upgrade MSL, check the RN for the 3300 ICP software you are installing.

1. Back up the 3300 ICP database to the Installer PC.
2. Upgrade MSL using the MCD installation CD (see the "Mitel Standard Linux Installation and Administration Guide" at http://edocs.mitel.com for detailed instructions).
3. Use the Software Installer to upgrade the 3300 ICP software.

Upgrading/Installing with Maximum Elements Change

The following options impact the upgrade/install procedure.

To upgrade and change to a default dimension:

- **30/60** maximum elements per cluster (with **default or flexed** dimensions) to **250**/999 maximum elements (with **default** dimensions)
- **250/999** maximum elements per cluster (with **default** dimensions) to **30/60** maximum elements per cluster (with **default** dimensions)

1. Back up the database (page 128).
2. Follow the standard full install procedure (page 90) using the Software Installer.
    - In the **License and Options Selection** form change **Maximum Elements per Cluster** to or from **250**. The Software Installer will reboot the controller.
3. **Restore** the database (page 130). Click the **Use the existing/current Dimension Selections** radio button.
4. When prompted, **reset** the controller (page 127).
5. Back up the database (page 128).

To upgrade and change to a flexed dimension:

- **30/60** maximum elements per cluster (with **default or flexed** dimensions) to **250**/999 maximum elements per cluster (with **flexed** dimensions)
- **250/999** maximum elements per cluster (with **default or flexed** dimensions) to **30/60** maximum elements per cluster (with **flexed** dimensions)

1. Back up the database (page 128).
2. Print the **Dimension Selection** form if you have flexed dimensions.
3. Follow the standard full install (page 90) procedure using the Software Installer, but do not Restore; **clear the Restore button**.
    - In the **License and Options Selection** form, change **Maximum Elements per Cluster** to or from **250** or **999**. The Software Installer will reboot the controller.

4. Complete the remaining steps in this procedure using the System Administration Tool. Log into ESM using the customer's username and password, then click **System Administration Tool**.
5. Program **Dimension Selections** to modify Dimension 19. If you had flexed dimension 17, program **Dimension Selections** using the printed dimensions from step 2 (see Change the Resource Dimension in the online help for details).
6. Reset the controller (page 127).
7. Restore the database (see page 130). Click the **Use the existing/current Dimension Selections** radio button.
8. When prompted, reset the controller.
9. Back up the database (see page 128).

Upgrade to Rel 6.0 or later with Flexed Dimensions

Use the Software Installer to install the Release 6.0 or later software and then use the System Administration Tool to restore your database.

To upgrade to Release 6.0 or later with flexed dimensions:

1. Print the Dimension Selection form.
2. Launch the Software Installer.
3. In the **Identification Screen**, enter the following:
   - 3300 ICP IP Address or DNS Name of the controller onto which you want to install the software
   - System Login ID
   - System Password
4. Click **Configure**. The Full Install Source Definition screen appears.
5. Select **Perform Full Install**. Enter the following information:
   - FTP Server IP Address
   - FTP Account Name
   - FTP Password
6. Click **Next** to open the Define Full Install Options screen.
7. Clear the Restore radio button. All four options are selected by default.

- **Backup** to create a Backup File
- **Install** to Install the Software
- **Configure** to configure the License and Options
- **DO NOT** select **Restore**

8. Click **Next** to launch the License and Option Selection screen.
9. Click **Next** to accept options without modification. DO NOT change the Maximum Elements.
10. Click **Next**.
11. Click **Start** on the Installation In Progress screen.

Time: This process takes approximately 45 minutes.

12. After the installation is complete, log into the System Administration Tool.
13. In the **Dimension Selection** form, change dimensions to match the quantities in the form that you printed in step 1 and click **Save**.
14. Reboot the system.
15. Launch the System Administration tool.
16. In the **Restore** form, select **Use current Dimension Selections (**select ***if Dimensions were modified*****)**.
17. Click **Start Restore**.
18. Reboot the system.
19. Back up the database.

Apply a Software Patch

Use the Software Installer to apply a software patch, from Release 4.1 and later. Get the patch (service pack) from Mitel OnLine or from Technical Support.

Tip: Always follow the steps in the **readme.txt** file for the most up-to-date installation instructions.They take precedence over the following instructions.

Time: This process takes approximately 15 to 30 minutes including reboot.

To apply a software patch with the Software Installer:

1. Copy the service pack software to a directory that is accessible to the Software Installer.
2. Launch the Software Installer.
3. Choose **3300 ICP** or **MXe Server** and click **Next**.
4. In the **SI Login Screen**, log in and complete the IP addresses. Click **Configure**.
5. Navigate to the location of the service pack software, select it, and select **Apply Patch**.
6. Choose to **Reboot immediately** or **Reboot manually** later. You must reboot your system for the patch installation to take effect.
7. The patch installation completes.

Distributing New Firmware to IP Phones

Use this procedure to distribute IP Phone firmware after you upgrade any controller in a resilient cluster.

1. Wait for all IP devices to return to their primary ICP (now upgraded).
2. Use the LOAD IPDEVICE 1 to 300 maintenance command to force a firmware reload of all devices.

Note: The Load command uses TFTP connections to transfer software to IP devices.Because the 3300 ICP supports a maximum of 300 TFTP connections at any one time, you must issue the command multiple times to load software to a large number of IP devices. For example to load software to 500 IP devices, you must issue the command twice:
LOAD IPDEVICE 1 TO 300
LOAD IPDEVICE 301 TO 500

Load IP Phone Software Remotely

Use the LOAD IPDEVICE maintenance command to transfer IP Phone software to the IP Phones. Because the 3300 ICP supports a maximum of 300 TFTP connections at any one time, you must issue the command multiple times to load software to a large number of IP devices. For example to load software to 500 IP devices, you must issue the command twice:

- LOAD IPDEVICE 1 TO 300
- LOAD IPDEVICE 301 TO 500

Use the IPDevice <1>, <2>...<1400> qualifier to load software into an individual IP device.

Use the IPDevice <1 TO 300> qualifier to load software into all IP devices (up to 300 devices at a time)

If IP Phones fail to load software:

1. Verify the network connection.
2. Verify power (is there a display?).
3. Check the wiring.
4. Check LED on the IP telephone for network activity.
5. A green LED on the bottom of the phone indicates a proper connection.
6. A flashing red LED indicates activity (data flow) on the network.
7. Use the PING (Packet Internet Groper) on the IP telephone to determine whether the server's (3300 ICP, DHCP, and/or TFTP) IP address is accessible.
8. Ensure that the DHCP server has been programmed with the correct information. Refer to the System Administration Tool online help for details.
9. If the IP telephone displays "TFTP LOAD FAILURE" verify that the TFTP Firmware, DSP and Main. software loads are available and not corrupted.
10. Ensure that the phone is registered with the system.

Downgrading to a Previous Software Release

If it becomes necessary to downgrade the system software, ensure that you have an off-board database backup that was created in the software version that you are going back to.

Table 12: 3300 ICP Downgrade Restrictions

Controller	Lowest software release supported
MXe III	MCD Release 4.2
MXe Server MXe II with 21363 DSP	Release 8.0
AX controller	Release 7.1
MXe II controller	Release 7.0
CX/CXi controller	Release 6.0
CX II/CXi II controller	MCD Release 4.0
LX controller	Release 5.0

Note: Some modules that are installed in the controller may not be supported by the lower software release. For example, the DSP II card is not supported below Release 9.0.

Chapter 5

Maintenance

Check System

Check Alarm State

Alarms indicate the functional state of the system.You can check the alarm status on the front panel of the controller (see LEDs—Appendix D Status LEDs on page 335), on the attendant console, or through the system administration tool.

- **No alarm:** The system is functioning properly.
- **Minor:** The system has detected a minor problem that may affect service.
- **Major:** The system has detected a problem that is causing a serious degradation of service.
- **Critical:** The system has detected a serious loss of call processing capability. System Fail Transfer is invoked by a Critical Alarm.

To view alarms through the system administration tool:

1. Go to the **Alarms Details** form in **Maintenance and Diagnostics**.
2. Enter the **show fault <alarm category>** maintenance command to view alarm information.

Check System Health

1. Click **Maintenance Commands** in the System Administration Tool.
2. Enter the following commands:
   - **SH ST AL**: Checks for system alarms. There should be no alarms.
   - **DBMS STAT**: Checks the status of the initialized flag. The flag is on if the system is in sync. If the flag is off, enter DBMS Save.
   - **PROG R DIS**: Displays the scheduled system reset. By default, the system reboots at 2:15 a.m. daily ONLY if there is memory fragmentation. To force a system reboot at the scheduled time, see the Programmed Reboot command.
   - **ME S**: Checks the status of the communication links. All links should be open.
   - **PCM TO**: Checks for circuit switch link faults; there should be none.
   - **DBMS CH B** or **F**: Brief checks the sanity of the database. Full checks the sanity and the current status of the database.

3. Click **Maintenance Logs - Error** to check for error logs or click **Maintenance Logs - All** to see all maintenance logs.
4. Check that you have recent backups of the database and hard drive.

Tip: You should make a backup at least once a week. Keep a copy of the last three backups.

Check Controller Hardware Profile

1. Click **Hardware Modules** in the System Administration Tool.
2. Click **Hardware Compute Cards** for data on the RTC / E2T.
   - Verify that the IP address of the E2T is the correct one.
   - Slot 1 is always the RTC. For a 100-User controller, this form displays the details on the RTC only.
   - Verify the value of the **Core Speed** field:
     For a 133 MHz system, the value is 132000000.
     For a 266 MHz system, the value is 264000000
     For a 300 MHz system, the value is 297000000.
     For a 450 MHz system, the value is 450000000.

Maintain VoIP Security

In an IP-enabled network, secure connections between IP endpoints is required and can be achieved in the following ways:

- Media Signaling Security ensures all messages transmitted over IP are encrypted.
- Voice Streaming Security ensures all voice packets transmitted over IP are encrypted. For more information about Secure RTP (SRTP), see Voice Streaming Security in the Online Help.

Secure Sockets Layer (SSL) and Security Certificate

To install the certificate:

1. On the **Security Alert** window, click **View Certificate**. The General window displays an error message meaning that you must trust the certificate and the Certifying Authority (CA) that issued the certificate.
2. Click **Certification Path**. Within the certificate chain, it is the Mitel Root CA that we need to trust.
3. Select **Mitel Networks Root CA** and click **View Certificate**.

4. Click I**nstall Certificate**.
5. Click **Next** to navigate through the Certificate Import Wizard windows.
6. Click **Finish** on the Completing the Certificate Import Wizard window.
7. Click **Yes** on the Root Certificate Store window.
8. Click **OK** until you can view the web page.

View Logs

View Maintenance or Software Logs

View maintenance and software logs from the System Administration Tool.

Table 13: System Reset Causes

Reset Cause	Interpretation	Root Cause
0x3	Hard reset	Unknown reset.
0x13	Checkstop reset (see PPC82XX manual)	Double bus fault as documented in the Power PC Manual(s).
0x43	Watchdog reset	The watchdog task was unable to write to the hardware watchdog. A higher priority task is running or interrupts are disabled. This is a software problem.
0x83	Power-on reset	The system lost AC power.
0x103	Programmed reset	The system software intentionally restarted the system.
0x203	Push-button reset	The front panel reset button was pressed.

Collect System Logs

Product Support may request logs in the event of a system failure (see Table 14 below). In the event of a system lockup, go to "Collecting System Lockup Logs Manually" on page 413.

Linux Software Logs on the MXe Server APC-MXe

The Linux software stores logs in the /var/logs directory. You can view these logs via the MSL web interface. You need root privileges to view these logs.

You can select specific sets of logs to look at, including system logs and Atlas logs. The system logs will indicate milestones in installing and starting the Atlas blade. The Atlas logs will indicate milestones in Atlas startup leading to a running Call Server.

Table 14: System Logs

Log Type	Log Purpose
pstswlog.db	Current system software and maintenance logs
backup pstswlog.db	May contain additional logs if the pstswlogdb is overwritten
xrtc	Software exception or trap on RTC
xe2t	Software exception or trap on E2T
premortem.txt	Network statistics on RTC
e2tpremortem.txt	Network statistics on E2T
system.wvr	System lockup events. Generated by entering debug commands or pre-installed sysinfo.txt during the lockup (refer to "Collecting System Lockup Logs Manually" on page 413).
output from RTC console	Additional error logs only output to the RTC console (see "Collecting System Lockup Logs Manually" on page 413).
diag.dat	Voice mail event file. Enter errlog_flush() before dumping the logs.
diag.sav	Voice mail backup event file.
master.dat	Voice mail master index for all mailboxes.

Collecting System Logs

To download the system diagnostics file to your computer:

1. Select **Maintenance and Diagnostics**.
2. Click **System Diagnostics Reporting**.

3. Select the **Download the files to my computer** radio button.
4. Click **Send System Diagnostics Report**.
5. Click **OK** to continue.
6. When the **File Download** dialog box appears, click **Save** (not Open).
7. Navigate to the desired folder on your computer or network drive.
8. Rename the file if desired (the file extension remains .tar.gz).
9. Click **Save**. The file is downloaded to your computer.

Collecting System Lockup Logs

Use the Remote on/off button to generate a debug diagnostic file. This procedure applies to 100, 250-700 user, MX, and LX platforms running Release 5.1.5.8 or higher only.

To collect system lockup logs:

1. Press and hold the Remote on/off button until all of the alarm indicators on the panel light (approximately 3 seconds).
2. Complete the “Collecting System Logs” procedure above.

Tip: Refer to page 412 for instructions for manually collecting logs.

View Logs Remotely, TCP/IP Socket Numbers

You can direct logs and Real Time Events to remote applications by setting up TCP/IP Output Streaming from the remote application.

Tip: The remote application must act as a TCP/IP client. The default setting is three sockets; maximum setting is ten sockets for each application.

To set up TCP/IP output streaming:

1. Open a Telnet session.
2. Under PORT, enter the appropriate socket number (see Table 15).
3. Enter the IP address of the controller RTC (*rtc_ip*).

Table 15: TCP/IP Output Streaming Settings

Log Output	Socket Number
Software Logs	1750
Maintenance Logs	1751
SMDR Logs	1752
Hotel/Motel Logs	1753
LPR1 Printer Port	1754
ACD Real Time Event	15373
IP PMS (Release 6.0)	15374
PMS Voice Mail Integration	6830

View Login and Logout Audit Logs

You can view login and logout audit logs from the System Administration Tool. Refer to the Online Help for instructions.

Downloading MXe Server Logs

You can download MXe Server logs from the Mitel Communications Director page of the server manager console. These logs are useful for troubleshooting the MXe Server.

1. Launch Microsoft Internet Explorer and go to the following URL: ***https:/192.168.1.8/server-manager***.
2. At the login page, enter
   Username: admin
   Password: (enter the Linux admin password that you set through the Server Console). The Managed Application Server Manager application opens.
3. Under **Applications**, click **Mitel Communications Director**. The Mitel Communications Director screen is displayed:
4. Click **Download MCD Logs Files**, click **Browse** and specify a folder on your computer and click **Save**. The logs are downloaded to the folder.

Detect Device Moves for E911

Device move detection, in support of E911 Emergency Calling Services, is critical to maintaining the accuracy of Customer Emergency Services ID (CESID) information. With Release 5.2 and later, the IP device location can be automatically updated or the location can be monitored for manual update. Detection of Layer 2 connectivity is through Spanning Tree Protocol (STP) or Cisco Discovery Protocol (CDP). The Device Connectivity form excludes Mitel Soft Phones, Symbol, DECT, and SpectraLink wireless phones, DNIC telephones, CITELlink telephones, and Hot Desk Users.

Automatic CESID has the following requirements and restrictions:

- All Layer 2 switches must report to CDP or STP or both (use one or both protocols consistently on all L2 switches in the network)
- Designate Emergency Calls using Route Lists
- Not supported on hubs
- CDP or STP must be enabled on L2 switches
- Automatic CESID will not function during a backup or restore

Monitor Device Moves

1. Log into the System Administration Tool.
2. Click **Device Connectivity - Moved**, or **Device Connectivity - All**. You can print or export the form (page 136).

Table 16: Device Connectivity Form Fields

Field name	Description
DN	Directory number of the IP device.
Date	Date and time of most recently reported L2 connectivity report from the set
Time	
Previous STP L2 Port MAC	MAC address of the STP Layer 2 switch where the IP device was connected before being moved.
	Page 1 of 3

Table 16: Device Connectivity Form Fields (continued)

Field name	Description
Previous STP Port Identifier	Port number on the STP Layer 2 switch where the IP device was connected before being moved.
Previous CDP L2 Port MAC	MAC address of the CDP Layer 2 switch where the IP device was connected before being moved.
Previous CDP Port Identifier	Port number on the CDP Layer 2 switch where the IP device was connected before being moved.
Previous CDP L2 IP Address	IP address of the CDP Layer 2 switch where the IP device was connected before being moved.
Last Known STP L2 Port MAC	MAC address of the STP Layer 2 switch where the IP device was connected on first registration or registration after a move. - "Unknown" device is one that does not support STP with its current firmware load. A 'Reload' of set firmware may be required. - "Not Supported" device indicates that L2 switches do not support STP. Contact the L2 switch provider; an upgrade may be required.
Last Known STP Port Identifier	Port number on the STP Layer 2 switch where the IP device was connected on first registration or registration after a move. - For some hardware manufacturers and/or network configurations, a designated port number may be reported by STP instead of actual port number. The designated port number is assigned to the port during STP convergence.
	Page 2 of 3

Table 16: Device Connectivity Form Fields (continued)

Field name	Description
Last Known CDP L2 Port MAC	MAC address of the CDP Layer 2 switch where the IP device was connected on first registration or registration after a move. - "Unknown" device is one that does not support CDP with its current firmware load. A 'Reload' of set firmware may be required. - "Not Supported" device indicates that L2 switches do not support CDP. Contact the L2 switch provider; an upgrade may be required.
Last Known CDP Port Identifier	Port number on the CDP Layer 2 switch where the IP device was connected on first registration or registration after a move.
Last Known CDP L2 IP Address	IP address of the CDP Layer 2 switch where the IP device was connected on first registration or registration after a move.
State	"In Service" or "Out of Service". This data used by the system to determine whether multiple in-service devices are connected through the same Layer 2 MAC and Port. Useful for identifying system configuration issues.
Move Acknowledged	"Not applicable" indicates a device that has not moved. This is the only editable field. After you have updated the Customer Emergency Services ID (CESID) Assignment form, change this field to **Yes**. Click **Data Refresh** to remove the device from the list of Moved devices.
	Page 3 of 3

Tip: Refer to the System Administration Tool online help for Device - Move examples and explanation of field information.

Detecting Device Moves

- Monitor the Device Connectivity - Moved form to identify devices that have moved. The monitoring schedule depends on how often you suspect devices may be moved, and the corporate emphasis on accurate Customer Emergency Services ID (CESID) information.
- In a resilient environment, it is usually sufficient to address a device move when it is detected on the Primary controller. If a device is moved while the primary controller is down, the move will be detected when the device comes back under the control of the primary.
- When you change a CESID Assignment for a phone DN in a Hot Desking environment based on a device move detection, the Mobile DN (Hot Desk) user should log out and log back in.
- When the Device Connectivity - Moved form indicates a device move has occurred in a resilient environment, you should update the CESID Assignment through OPS Manager's Moves, Adds, and Changes so that the CESID change is propagated to all controllers.
- The device move detection feature requires that the sets have the Release 5.0 or later firmware. You can update the firmware in three ways: issue the **LOAD IP DEVICE 1 to 700** command; power down the sets; or by a loss of connectivity with the 3300 ICP for 10 minutes or more.
- In a case where the primary 3300 ICP is Release 5.0 or later and the secondary is Release 4.x, a device move will not be detected if it occurs while the set has failed over to the secondary. The move will be detected when the device comes back under the control of the primary 3300 ICP with Release 5.0 or later software.

Viewing Device Connectivity Logs

To view device connectivity logs:

1. Click **All Maintenance Logs**.
2. Select **Source** in the **Go to** drop-down list.
3. Type **device move detection** in the **value** field.

Analyze IP Phone Issues

Use the Mitel 3300 ICP IP Phone Analyzer to collect performance information from the IP devices on the network.

Tip: The PC must be connected to the network via a Layer 2 switch port on the controller.

Install the IP Phone Analyzer

Install the IP Phone Analyzer on a PC running Windows NT, Windows 2000, Windows XP, or Windows 98.

1. In the System Administration Tool, program the IP address of the PC to Option 131 for pre-Release 7.0 systems or to the ipa_srv tag in Option 43 for Release 7.0 and later systems.
2. Insert the MCD software CD-ROM in the PC's CD drive.
3. Open the CD's **Tools** folder, then the **Phone Analyzer** folder.
4. Double-click **Setup.exe**. Follow the IP Phone Analyzer install prompts.

Launch the IP Phone Analyzer

1. Open **Mitel IP Phone Analyzer** (**Start**/**Programs**).
2. For instructions on how to interpret IP Phone information, refer to IP Phone Analyzer Online Help.

Enable Tool Analysis

1. Select **Commands**, then **Register Set**.
2. Enter the IP address of the IP telephone.

   To enable tool analysis

   - From the IP telephone, reboot the phone to add the IP address of the PC to the telephone. The IP address appear on the IP Phone Analyzer Status View window.
   - From the System Administration Tool, issue the **LOAD IPDEVICE ALL** maintenance command to monitor all IP telephones. There will be a service outage while the telephones reset.

Disable Tool Analysis

To disable tool analysis from the PC hosting the Analyzer Tool:

- Access the **Status View** window, left-click on the IP address, then right-click and select **Delete**.

To disable tool analysis from the System Administration Tool:

1. In the **DHCP Options** form for Release 7.0 and later systems, disable IP messaging to the PC tool by deleting the IP Phone Analyzer Address from the appropriate Option 125. For earlier releases, delete option 131.
2. To disable the monitoring of all IP telephones, issue the **LOAD IPDEVICE ALL** maintenance command.
   There will be a service outage while the telephones reset.

To disable tool analysis from an IP telephone:

- Restart the set to clear the PC IP address from the telephone.

Disabling/Enabling Voice Encryption

To Disable Voice Encryption:

1. From the System Administration tool, access the System Options form.
2. The Voice Encryption Enabled field is set to "Yes" by default.
3. Click **Change**.
4. To disable voice encryption, select **No**.

Power Down the Controller

To power down the MXe Server:

1. Shut down the controller operating system before turning off the power switch by
   - log in to the MSL shell and type “shutdown -h now”
     OR
   - start the Server Manager and shut down using the **Reboot or Shutdown** panel.
2. Continue with the procedure, “To power down the controller, Release 7.0 and later:” below.

To power down the controller, Release 7.0 and later:

1. In the System Administration Tool, navigate to Maintenance Commands.
2. Enter the **Shutdown** command.
3. Remove power:
   - for the AX and MXe, set the power switch(es) to OFF
   - for all other controllers, remove the power cord.

To power down the controller, prior to Release 7.0:

1. Type **appShutdown** at the RTC shell.
2. When the controller boots up, the communication program will instruct you to **Press <SPACE><SPACE><SPACE> to stop auto-boot AFTER countdown starts** (Release 5.2 and later) or **Press any key to stop auto-boot** (prior to Release 5.2).
3. Remove the power cord.

Perform a System Reset

To reset the system:

1. Log into the System Administration Tool (page 71).
2. In the Maintenance Commands form:
   - Rel 7.0 and later, enter the **reset system** command, or
   - Prior to Rel 7.0, enter the **LOAD 1** command.

Back Up a Database

Tip: It is very important to maintain current database backups; backups should be done on a regular basis.

Tip: Many of the following procedures assume that you have voice mail. If you don't have voice mail, please disregard voice mail-related steps.

Tip: Voice mail messages cannot be backed up on the AX.

You need the following information and equipment to back up a database:

- ❒ Installation/Maintenance PC (see page 13)
- ❒ IP address of the Controller
- ❒ System Administration Tool username and password

During the first minute of the backup process, the voice mail system is not accessible (Ring-No Answer). Voice mail will remain in Ring-No Answer state until all voice mail users are disconnected from the system. Ensure that no one is connected to voice mail before you begin your backup.

Verifying if Anyone is Connected to the Voice Mail System

Ensure that all PLIDs are "Not applicable" or "Idle" by using the following maintenance commands in the System Administration Tool:

- **stat 1 4 27**
- **stat 1 4 28**

Time: The system takes 30 to 90 minutes to back up an average-sized database (50-100 MB), and approximately 4 hours to back up a large voice mail database (600 MB).

To back up the databases:

1. Click **Maintenance and Diagnostics**.
2. Click **Backup**.
3. Copy the **identitydb.obj** file to your PC (required for every user profile on every PC used for backup and restore). Follow the instructions displayed on the screen.

Tip: Do this only once per PC per user.

4. Click **Browse** to launch the **Save As** dialog box, then navigate to the location on your local drive where you want to save the backup file (for example C:\3300_ICP\backup).
5. Type a name for your backup file, and then click **Save As**.
6. Select the check box for Call History records and/or Voice mail messages if you want them included in your backup. Each addition can increase the backup time noticeably.
7. Click **Start Backup**. System will display progress and then a backup complete message.
8. Click **OK**.
9. Verify the presence of the backup file on the local drive.

CAUTION: During a system backup, no other users can access any of the web- based tools (5140/5240 IP Appliance Online Services, Visual Voice Mail, Desktop Tool, Group Administration Tool, or System Administration Tool), access Visual Voice Mail, or save changes. To avoid blocking other users, we recommended that you perform system backups outside of business hours.

Verifying the Backup

To verify that the backup contains voice mail messages:

1. Add the extension **.tar** to your backup file (for example, change May10 to May10.tar).
2. Use WinZip to open your renamed **.tar** file.
3. Look for the voice mail files:
   - **002Vxxxxxxx.yyy** (where xxxxxxx is a variable, system-generated string) contains all messages.
   - **003msgxxxx.vox** (where xxxx is the extension number) contains the status of messages belonging to that extension.

Restore a Database

Use this procedure to restore a previously saved database.

Tip: The system does not allow you to log in during the restore and reset period. Once the system has completed the restore and reset, you should see "deleting/ipservicesdb.tar" in the RTC. This is a good indication that you can log back in to the System Administration Tool.

Tip: Restoring a database from one platform to another requires that the two databases match in the modules and add-ons, including embedded analog circuits programmed. As an example, the database from a controller programmed with TDM modules cannot be restored on an MXe Server unless all of the TDM configurations are deleted first.

Table 17: 3300 ICP Restoring Restrictions

Restore path	Restore allowed?
Prior to release 3.3 database	No
3.3 to release 4.1 or later	Yes
LX database to MX	No - if the database had CIM 3 or 4 configured Yes - if you first delete the CIM config
MX database to MXe	No - if AOB was configured Yes - if you first delete the AOB configuration
Other controller database to MXe Server	No - if other controller has TDM interfaces or CIMs are configured Yes - if delete all TDM configs, all CIM configs, voice mail and record-a-call
Database from one system with embedded analog circuits to another system with embedded analog circuits	No - if systems provide for different numbers of embedded analog circuits Yes - if the number of embedded circuits match
Note: The LX and the MXe Server have no embedded circuits. **Note:** You cannot restore a database backed up from a 3300 system (100 User, LX, MX, AX, MXe) to an MXe Server.	

CAUTION: You must reboot the controller after restoring a database. Service will be LOST during this reboot.

You need the following information and equipment to restore a database:

- ❒ Installer PC (page 13)
- ❒ IP address of the Controller
- ❒ System Administration Tool username and password

Database Restore Procedure

Time: The system takes approximately 30 to 90 minutes to restore an average-sized database, during which time the files are copied to the controller. Once the files have been copied, you must reset the controller. Note that the system can take up to an additional 1 hour to reset.

Time: Restoring an AX database may take longer than 90 minutes.

Tip: When restoring an AX database, the voice mail messages are not restored because they are not saved when doing a backup.

1. Click **Restore** in the **Maintenance and Diagnostics** menu.
2. Copy the **identitydb.obj** file to your PC (required for every user profile on every PC used for backup/restore). Follow on-screen instructions.

   Tip: If you are doing the restore on the same PC the backup was saved to and you are logged in as the same user (same user profile), you don't need to copy the **identitydb.obj** again.
3. Type the location of the database that is being restored, or use the browse facility.
4. Click **Yes** if you want to include Hotel/Motel wake up and room status information in the restore.
5. Prior to Rel 5.1:Choose the Dimension Selections (page 107)
   - if there are no changes to the software dimensions, accept **Use Dimension Selections from backup file**

   OR

   - if you are using new Dimension Selection information, click **Use Current Dimension Selections**.
6. Click **Start Restore**.
7. Click **OK**. The system will show an "in progress" message.
8. When the status window shows "complete", click **OK**.

9. **Reset** the controller (page 127). When the reset is complete, the database is converted, and the system **automatically resets**.
   - If you have programmed Dimension Selection, the system reboots automatically one more time.

Tip: While the System Administration Tool is restoring the database, no other users can access any of the web-based tools. Users cannot access Visual Voice Mail or save changes. We recommend performing restores outside of business hours.

Verify the Restore

CAUTION: Do not reset any system components (Controller, NSU, ASU, and so on) while executing the following checks.

CAUTION: Rebooting the controller before the Analog Main Board and Analog Options Board load can render the boards inoperable.

1. Verify that one of the NSUs are loading. If they are, wait until they have finished loading. To verify that L0/L1 LEDs are not marching, see "Universal NSU LED States" on page 357 and "R2 NSU LED States" on page 358.
2. Log into ESM (using the customer's username and password), then click **System Administration Tool** and select **Maintenance Commands**.
3. Issue the **dbms stat** maintenance command to check if the DBMS_Initialized flag is ON. If it is, you'll see

   ```
   DBMS info: DBMS_Initialized is ON
   ```

4. Issue the **Type *.dr.logfile_1** maintenance command to display the log file created during the Data Restore. Wait until the checks are complete, then review the log to ensure there were no errors during the restore procedure.
5. Issue the **message subsystem (me sub)** command to check the programmed NSU links; they should be OPEN. If any programmed links are in SCAN, check the LINK STATUS LEDs; if the amber LEDs are marching, the NSUs are writing to the RAM DISK.

Migrate SX-2000 Database Across Platforms

To migrate an SX-2000 database to a 3300 Release 7.0 system and up, you use the 3300 ICP Configuration Tool to back up the SX-2000 database and then use the Software Installer Tool to restore the SX-2000 database file to the 3300 ICP.

SX-2000 software version	Migration procedure
LW 34.2 or later	• upgrade SX-2000 to LW 34.2 • use Configuration Tool to make a backup • use the Software Installer to restore the backup to a 3300 ICP running 7.0 software (or higher version)
older than LW 34.2	• use Configuration Tool to make a backup on the SX-2000 • use Configuration Tool to restore the backup to a 3300 ICP running 6.1 software • upgrade the 3300 ICP to Release 7.0 or later.

Note: You can migrate an SX-2000 MicroLight cabinet for use in a 3300 ICP system. See “Migrate SX-2000 PBX Hardware” on page 411 for details.

Note: You cannot migrate an SX-2000 database to an AX controller.

Prerequisites

- Use the 3300 ICP Configuration Tool or Mitel OPS Manager to prepare the SX-2000 for migration. See “Migrating the SX-2000 Database” in the 3300 Configuration Tool Help or “Migrate element databases” in the OPS Manager Help.
- Ensure you have a backup file of the SX-2000 database and know its location.

To migrate the SX-2000 database:

1. To migrate the SX-2000 database, verify the **Database Restore** box is checked, or
   To restore the SX-2000 database file, confirm that the **Restore from the SX-2000 database file** box is checked.
2. Click **Browse**.

3. Navigate to the SX-2000 database file to be restored and click on the file to select it. The filename will automatically be entered in the text box.
4. To restore your Hotel/Motel options, select the Restore Hotel/Motel wakeup information option. This option restores the wakeup information and the room status.
5. Accept the default Use Dimension Selections from the software load to be installed.
6. Click **Next**. If you have chosen to perform LOS configuration, the wizard will display the LOS Configuration Screen; otherwise, the wizard will proceed to the final screen.

Converting a PRI Database on a Universal NSU

To convert a Universal NSU PRI database:

1. Install the IMAT from the 3300 software CD-ROM (page 74).
2. Launch the new IMAT and connect to the Universal NSU.
3. Load the database from your previous IMAT backup.
4. Select PRI and NSU version from Table 18 for your new database version.
5. Convert the database and then save the new database into the NSU.

Table 18: PRI, NSU DB version to use with 3300 ICP Software version

3300 ICP Software Version	Universal NSU Database Version
Release 3.0 - 3.3 (NSU or PRI card)	PRI 8.0 or NSU 1.1
Release 4.0 (NSU or PRI card)	PRI 8.1 or NSU 1.2
Release 4.1 - 5.0 (NSU or PRI card)	PRI 8.2 or NSU 1.3
Release 5.1 (NSU)	NSU 1.4
Release 5.2 (NSU)	NSU 1.5
Release 5.1 - 5.2 (PRI card)	PRI 8.2 or NSU 1.3
Release 6.0 and 6.1	NSU 1.5
Release 6.0 - 6.1 (PRI card)	PRI 8.2 or NSU 1.3
Release 7.0 and 7.1	NSU 1.6
Release 7.0 - 7.1 (PRI card)	PRI 8.2 or NSU 1.3
Release 8.0 - MCD 4.0	NSU 1.7.0.xx (See 3300 ICP RN for specific version to use)

Export Configuration Data

You can export data from most forms in the System Administration Tool into comma separated files (.csv) files. You can then use the Mitel Integrated Configuration Wizard to import the data from the .csv files into another system. If you want to view or edit the exported data, Microsoft Excel must be installed on your client station.

To export form data

1. Launch the System Administration Tool and navigate to the form.

Note: Not all forms support the exporting of data and not all forms support all the export options. If options are not supported for a form, they will be disabled ("grayed out") in the export dialog window.

2. If you want to export the data for a single record, click the record. To export a selection of records, click the first record that you want your selection to start with.
3. Click **Export**.
4. Choose the export range.
5. Choose **Comma Delimited (Spreadsheet)** as the file type.
6. Click **Export**.

CAUTION: Depending on the amount and type of data being exported, there could be a significant delay before the Save As dialog box is displayed. While data is being retrieved from the system database, other users cannot access or use the Desktop Tool, the Group Administration Tool, or the System Administration Too

7. After the File Download dialog box appears, click **Save**. Do not click Open. After the system retrieves the data, the Save As dialog box appears.
8. Navigate to a folder on your computer or the network.
9. If desired, change the filename. By default, files are given filenames in the following format:

   Filename={Form Name (max 6 letters)}_{Switch Name (max 4 letters)}_{date followed by 24-hour time (YYYYMMDDHHMM}

   Example: TelDir_Mn98_28031205.csv
10. Ensure that the file extension is .csv:
11. Click **Save**.
12. Click **Open** to view the exported data.

Import Configuration Data

You can export the form data from an existing system into .csv files and then use the Mitel Integrated Configuration Wizard to import the form data into a new system.

To import configuration data using the Configuration Wizard:

1. Export the desired form data from the existing system into .csv files (see “Export Configuration Data” on page 136).
2. Launch the Configuration Wizard and select **Create a New Configuration**.
3. Select the type of configuration that you want to create.
4. Click Next to advance through the wizard. Enter the information requested on the screens.
5. When you reach the 3300 ICP - Advanced Configuration screen, select the **Import additional forms from csv files** check box. If the check box is cleared, all field entries are ignored.
6. To add a .csv file to the import list, click **Add**, select the .csv file, and click **Open**.

Note: The list order is irrelevant.

7. To remove a .csv file from the list, select the file and click **Delete**.
8. Click **Next** to view a summary.
9. Save and implement the new configuration.

CAUTION: If you import a .csv file associated with a form that is modified by the Configuration Wizard, you will overwrite your wizard selections.

Restoring Default Addresses on MXe Server

1. Launch Microsoft Internet Explorer and go to the following URL: ***https:/192.168.1.8/server-manager***.
2. At the login page, enter
   Username: admin
   Password: (enter the Linux admin password that you set through the Server Console). The Managed Application Server Manager application opens.
3. Under **Applications**, click **Mitel Communications Director**. The Mitel Communications Director screen is displayed.
4. Click Modify.
5. Click **Restore Defaults** at the bottom of the IP Addresses screen. After you press this button a screen with the default IP address values is displayed.
6. Enter a valid IP address on the local network in the Layer (L2) IP field. The address MUST be different than the APC Gateway IP address.
7. Click **Save** to apply the addresses. A success message is displayed. If you did not change the Layer (L2) IP address to be different from the APC Gateway IP address, the system displays an error message.

Assign Static IP Addresses to IP Phones

The customer may prefer to assign static IP addresses to IP sets rather than using dynamic IP addressing. You cannot set static IP addresses on non-display sets.

Setting Static IP Addresses on Dual Mode Sets

On the 5215 IP Phone (Dual Mode), press ***** (yes), **0** (default), and # (no); on the 5220 IP Phone (Dual Mode), press the three softkeys to select menu items.

Accessing the Configuration Menu

Method A: To access the menu during the phone boot sequence:

- Hold down both volume keys until NETWORK PARAMETERS? appears.

Method B: If the phone is up and running with the MiNet main load:

1. Hold down both volume keys at the same time.
2. Continue to hold the down volume key and release the up volume key.
3. Press 234 on the telephone key pad and then release the down key.
   - NETWORK PARAMETERS? appears.
4. Proceed to “Viewing and modifying the static IP address:” on page 140.

Method C: Using hotkeys, at power up, press and hold the following key combinations:

Table 19: Accessing the Configuration Menu: Method C

Key Sequence	Function
* and 6 (M)	Change mode to MiNet
* and 7 (S)	Change mode to SIP
7	Jump to “Config Teleworker” menu
*	Erase the PIN and VCON configuration
any other keypad keys	Display “Configure Phone” prompt
Note: Hotkeys access provides limited access. Methods A and B provide full access	

Viewing and modifying the static IP address:

1. Access the Configuration (Debug) Menu on the IP Phone. Refer to the 3300 ICP Troubleshooting Guide for instructions.
2. At NETWORK PARAMETERS?, press **Yes**. VIEW CURRENT VALUES? appears.
3. Do one of the following:
   - Press **Yes**, and then press the Up/Down volume keys to view each setting. When you return to VIEW CURRENT VALUES?, press **No**. VIEW STATIC VALUES? appears.
   - Press **No**. VIEW STATIC VALUES? appears.
4. Do one of the following:
   - Press **Yes**, and then press the Up/Down volume keys to view each setting. When you return to VIEW STATIC VALUES?, press **No**. MODIFY STATIC VALUES? appears.
   - Press **No**. MODIFY STATIC VALUES? appears.
5. Do one of the following and then reboot the phone:
   - Press **Yes**, and then press the Up/Down volume keys to scroll through each setting. Use the keypad to modify the **Phone IP address (static)**, and then follow the prompts to store the changes and reboot the phone.
   - To reset the factory defaults, press **Default**, and then follow the prompts to set and store the factory defaults and reboot the phone.
6. To exit the current menu without a reboot:
   - To return to the main menu, press **Yes** at EXIT MENU?
   - To return to the default display, press **Superkey**.

Setting Static IP Addresses on Non-Dual Mode Sets

To set static IP address on the IP telephones:

1. Plug the set cable and power into the set while holding down the **Volume Up** key for 3 seconds to display **Set Static IP (Yes #/No *)**.
2. At the **STATIC IP SETUP MODE**.
   - Use the **Volume Up/Down** keys to navigate
   - Use the ***** key to back up (to correct an error)
   - Use the # key to insert a decimal and move to the next field.

3. At the **USE PRESENT SETTINGS** screen, select **# - ENABLE** to enter a complete set of IP data.

Tip: Select * - DISABLE to revert back to DHCP from static parameters.

4. At **INPUT VLAN ID**, if VLANs are used, enter the VLAN ID that will be inserted into packets sent by the phone. Enter nothing if VLANs are not used.
5. At **INPUT PRIORITY**, enter **6** if priority is used or leave blank.
6. At **INPUT IP ADDRESS**, enter the customer-supplied static IP address (e.g. 10.30.27.191).
7. At **INPUT PDA ADDRESS**, enter the customer-supplied static IP address (not for single line display sets).
8. At **INPUT SUBNET MASK**, enter the subnet mask.
9. At **INPUT DEFAULT GATEWAY**, enter the Router IP address (e.g. 10.30.27.2).
10. At **INPUT RTC ADDRESS** (**SRVR IP** on single line sets), enter the RTC address.
11. At **INPUT TFTP ADDRESS** (**TFTP SRVR IP** on single line sets), enter the address of the TFTP server used to download the main and boot load images.
12. At **INPUT DNS ADDRESS**, you MUST enter the IP address of the server that will be used during Web browsing to resolve host names into IP addresses. Skipping this field will prevent the phone from booting. If you do not have a DNS server, enter any IP address value (for example 10.30.32.3).
13. The following prompts are required fields for IP Appliances, optional for multiline display sets, and do not appear for single line display sets:
    INPUT WINS ADDRESS
    INPUT PROXY ADDRESS
    INPUT PROXY PORT
14. At **USE JITTER BUFFER**, enter **Yes #** or **No ***
15. At **TECHNICIAN IP ADDR?**, enter the address of the debugging utility, or leave blank.
16. At **STORE IN NVRAM?**, enter **Yes #** to store parameters in non-volatile RAM. This step will ensure that your static setting will be used when the set is powered-up and when the FLASH is upgraded.
17. The set will reboot and will then use the static IP data.

Removing Static IP Addresses on the IP Sets

To return to using dynamic IP addressing when static parameters were previously enabled:

- Plug the set cable and power into the set while holding down the **Volume Up** key for 3 seconds to display the **STATIC IP SETUP MODE.**

At the **USE PRESENT SETTINGS** screen, select *** - DISABLE** to revert back to DHCP from static parameters.

Providing Power Over Ethernet to Devices (CXi/CXi II)

The CXi and CXi II controller's Layer 2 switch can provide 100 Watts of power to 802.3af-compliant devices according to the following general rules:

- Up to 16 IP Phones are supported.
- Up to four PKMs (PKM12 or PKM48) are supported on Dual Mode IP phones. Only one PKM can be attached to a set. Multiple PKMs on a set require an AC adapter.
- Conference units require an AC adapter.
- Port 1 has the highest priority, port 16 the lowest. If the power budget is exceeded, power will be turned off to the ports, starting with port 16 and ending with port 1, until less than 100 Watts is being consumed.

Tip: Refer to Table 119 on page 392 for a list of all Mitel IP Phones and their power consumption. For more detail, see the *3300 ICP Engineering Guidelines*.

Recover MXe Server

Use this recovery procedure if both hard drives have failed.

Before You Begin

To complete this procedure, you will require

- ❒ Backup of 3300 ICP database
- ❒ Replacement hard drive(s)
- ❒ Laptop
- ❒ External USB connected CD/DVD drive
- ❒ Communications application (for example, Hyperterminal)
- ❒ RS-232 serial cable
- ❒ Ethernet cable (straight-through)
- ❒ Mitel Communications Director Recovery CD
- ❒ MCD Software Installer tool
- ❒ Application Record Identification Number (AMC ARID)

Install Replacement Hardware

1. If possible, back up the current database. If you cannot back up the database, obtain a previous backup and save it to your laptop.
2. Power down the MXe Server.
3. Replace the faulty hardware. See “Replace Both Hard Drives in an MXe Server” on page 213.
4. Power up the MXe Server and wait 3 minutes. It takes approximately 3 minutes before the software enables the printer port.

Connect Laptop PC and CD/DVD Drive

5. Connect the RS-232 serial cable between the COM 1 port on your laptop to the server printer port (see Figure 26).

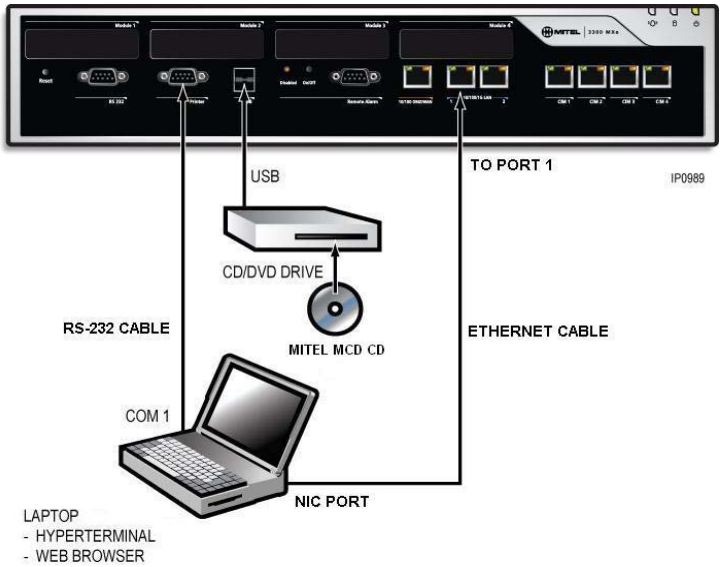


Figure 26: Laptop and CD/DVD Connections

6. Connect the CD/DVD drive to the USB port on the MXe Server.

7. Open a communication application (for example ProCom or Hyperterminal) on your laptop to the 3300 ICP and set the connection parameters as follows:

Table 20: Communication Connection Parameters

Parameter	Required Setting
Port	COM 1 (for example)
Bits Per Second	38400
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
Emulation	VT100

Install Mitel Application Server Software

8. Insert the Mitel Communications Director Recovery Disk that was shipped with the MXe Server into the external CD/DVD drive.
9. Run the CD-ROM test. It takes approximately 5 minutes to complete.
10. Reset the MXe Server by pressing the Reset button on the front panel. After several seconds, the system BIOS appears.
11. The Mitel Application Server (MAS) operating system initializes and the Server Console window opens. You are prompted to set the following parameters in a series of screens. For VT100 sessions, press the Enter or Return key to commit selections.

Table 21: MAS Installation Settings

MAS Installation Screen	Setting
Choose Language	Choose **English**
Type of Media	Select **Local CD-ROM**
No Driver Found	Choose **Select Driver**
Select Device Driver to Load	Select **USB Mass Storage Driver for Linux (usb-storage)**
CD Found (Test CD Media)	Select **OK** to test Media
If you are prompted to upgrade (replace hard drive) or reformat	Select **Erase all Disks and perform a Fresh Install**
Warning - All disks will be Reformatted and any data will be lost. Proceed?	Select **Yes**
Time Zone Selection	Select the country to set time zone
Formatting / file system . . . . Package Installation	

12. When prompted, remove the CD and select **Reboot** to reload the MAS operating system with the new settings. The software takes approximately 10 minutes to reload.

Configure MAS Parameters

13. After the Server Console screen appears, you are prompted to accept the End-User License Agreement. Select **Accept**.

14. In the configuration screens, select the following settings:

Table 22: MAS Configuration Parameters

Configuration Screen	Required Setting
Restore from Backup (this screen relates to a backup of the Linux database)	Select **No**.
Choose Linux Admin Password	Enter a password. Then enter it again to verify it. Note that passwords are case-sensitive. Also, see the Caution below this table.
Select Primary Domain Name	Enter name (for example **mitel.com**)
Select System Name	Enter name (for example the company name)
Enter Local Networking Parameters (local IP address for this server)	Enter **192.168.1.8** (INITIALLY, KEEP AS DEFAULT!!!)
Select Local Subnet Mask (see Note below)	Enter **255.255.255.0**
Select Operating Mode	Select **Server-only**
Select Gateway Address	Enter **192.168.1.1** (INITIALLY, KEEP AS DEFAULT!!!)
Set DHCP Server Configuration	Select **Off - Do not provide DHCP Service to local Network**
Corporate DNS Server Address	Enter your corporate DNS server IP address.
Activate Configuration changes	Select **Yes**

Note: Use 255.255.255.0 unless your network requires a different subnet mask. If your network requires a different Local Subnet Mask, change it now. You can only change the subnet mask through the server console. In the MAS Server Manager application, the subnet mask is a read-only field.

CAUTION: Ensure that you record your Linux Admin password. If you lose this password, it cannot be recovered. You will have to re-install the MAS software and set a new password.

Configure Server Manager Fields

15. If running VLANs, ensure that the VLAN ID is reset to the default value of 1. If the VLAN ID is set to a different value, you will be unable to establish communication to the server via your laptop. To reset the VLAN ID to 1

- Move the RS-232 serial cable from the printer port to the RS-232 port on the MXe Server. Change the serial port speed to 9600 bps. You will see the boot line display.
- Interrupt the boot line by entering 3 spaces (press the space bar on your keyboard 3 times).
- At the (VxWorks Boot): prompt, type **cv** and press the **Enter** keyboard key. The VLAN ID is reset to 1.
- At the (VxWorks Boot): prompt, type @ (Shift and 2 keyboard key) and then press the **Enter** keyboard key.
- Move the RS-232 cable from the RS-232 port to the Printer port on the MXe Server. Change the serial port speed back to 38400 bps.

16. Connect the ethernet cable from the Network Interface Card (NIC) connector on your laptop to Port 1 of the MXe Server.

17. On your laptop set the NIC IP address to 192.168.1.20. The following steps are for Windows 2000 or Windows XP operating systems:

- Click **Start**, click **Settings**, click **Network and Dialup Connections**, and then click **Local Area Network Connection**
- Select **Internet Protocol (TCP/IP)**
- Click **Properties**.
- Select **Use the following IP address**
- Enter the following IP address: 192.168.1.20
- Enter Subnet Mask: (use the same Subnet Mask that you configured for the APC)
- Click **OK**
- Click **Start**, click **Settings**, click **Network and Dialup Connections**, and then click **Local Area Network Connection.** Ensure that the connection is **Enabled**.

18. Launch Microsoft Internet Explorer and go to the following URL: ***https:/192.168.1.8/server-manager***.

19. At the login page, enter
Username: admin
Password: (enter the Linux admin password that you set through the Server Console). The Managed Application Server Manager application opens.

20. Under **Applications**, click **Mitel Communications Director**. The Mitel Communications Director screen is displayed:

Figure 27: Example of Mitel Communications Director Screen

21. Click **Modify** to change the existing System IP Address and the APC Gateway Address.

22. Enter the new System IP Address and APC Gateway Address. The IP addresses in the following screens are examples only.

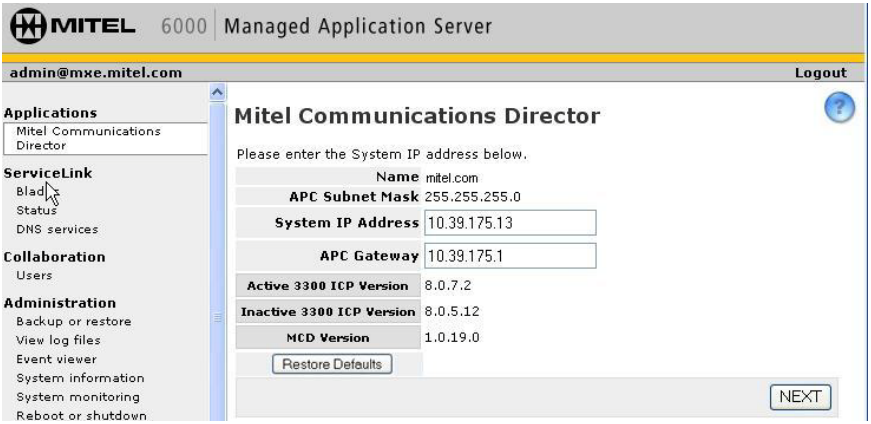


Figure 28: Change the System IP and APC Gateway Addresses

23. Click **Next**. After you click **Next**, you should see a message stating that the addresses were successfully modified displayed in green text. The system automatically reserves four IP addresses that are required to support the system in the network. These addresses must be valid, contiguous, and available in the network.

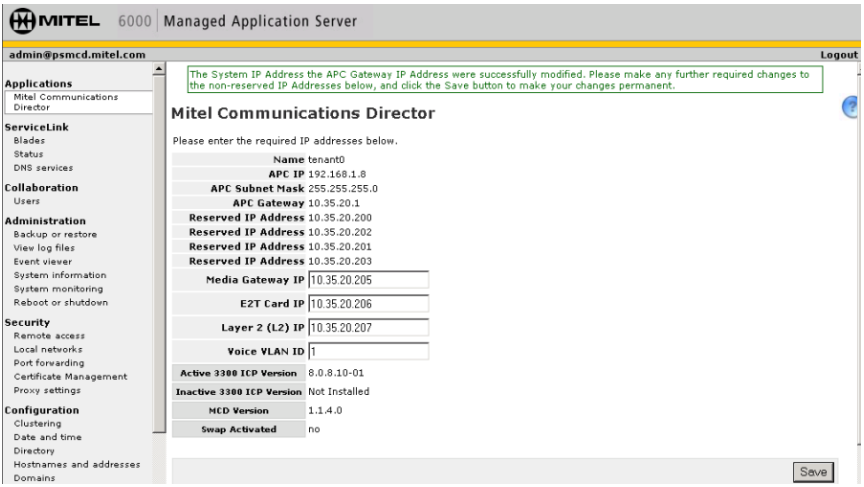

MITEL 6000 Managed Application Server
admin@psmcd.mitel.com
Logout
The System IP Address the APC Gateway IP Address were successfully modified. Please make any further required changes to the non-reserved IP Addresses below, and click the Save button to make your changes permanent.
Mitel Communications Director
Please enter the required IP addresses below.
Name tenant0
APC IP 192.168.1.8
APC Subnet Mask 255.255.255.0
APC Gateway 10.35.20.1
Reserved IP Address 10.35.20.200
Reserved IP Address 10.35.20.202
Reserved IP Address 10.35.20.201
Reserved IP Address 10.35.20.203
Media Gateway IP 10.35.20.205
E2T Card IP 10.35.20.206
Layer 2 (L2) IP 10.35.20.207
Voice VLAN ID 1
Active 3300 ICP Version 8.0.8.10-01
Inactive 3300 ICP Version Not Installed
MCD Version 1.1.4.0
Swap Activated no
Save

Figure 29: Enter the New Addresses

24. Enter three, valid, available, and contiguous IP addresses for the

- Media Gateway IP (IP address of the Real Time Controller card)
- E2T Card IP
- Layer 2 (L2) IP

25. Enter the Voice VLAN ID (1 to 4093), if required for the network.

At the bottom of the Mitel Communications Director screen, the following information is displayed:

Active 3300 ICP Version: currently active system software version
Inactive 3300 ICP Version: previous system software version before latest upgrade. On an initial installation of the 3300 ICP, this field displays "Not Installed".
MCD Version: current Mitel Communications Director software version that was installed from the system software CD-ROM. It is not the software version of the MCD blade software.
Swap: reboots the call server with the currently inactive software version. The currently active version becomes the inactive software version after the reboot. Swap is only displayed if an Inactive version of the 3300 ICP software is installed.

Do not enable the **Swap** option during this procedure.

26. Click **Save**. The E2T and RTC cards are updated with the new IP addresses, subnet mask, and VLAN ID.

27. Open a communication application (for example ProCom or Hyperterminal) on your laptop to the 3300 ICP and set the connection parameters (see Table 20). Log in to the server console again.
Login: admin
Password: (enter the Linux admin password)

28. Select "Configure this server". Click **Next** until "Local Networking Parameter" is displayed.

29. Enter the IP address of the APC-MXe card that is appropriate for your network. The Gateway IP address changes to x.x.x.1.

30. Click **Next** until the Reboot screen appears.

31. Reboot the server.

32. Change the address of the laptop's Network Interface Card (NIC) back to the IP address for your network. The following procedure is for Windows 2000 or Windows XP:

- From the Windows **Start** menu, click **Settings**, click **Network and Dial-up Connections**, and then click the Local Area Network of the laptop NIC card
- Click **Properties**.
- Select Internet Protocol (TCP/IP)
- Click **Properties**.
- Click "Use the following IP Address" option.
- Change the address of the NIC to the Network IP Address
- Click **OK**.
- In the Network and Dial-up Connections window, right-click on the connection for the laptop NIC and click **Enable**.

You can now connect to the Mitel Communications Director through gigabit ethernet Port 1 of the MXe Server.

33. Launch Microsoft Internet Explorer and go to the following URL: ***https:/<your APC IP>/server-manager***.

34. At the login page, enter
Username: admin
Password: (enter the Linux admin password that you set through the server console). The Server Manager application opens.

35. If the PC that you use to run the MCD Software Installer Tool is not installed on the same network as the MXe Server, you must add the network. Under **Security**, click **Local Networks** and add the IP address of the network. Also add the networks of any other Mitel applications or tools, such as OPS Manager, Enterprise Manager, system administrator client stations and so forth that require access to the MXe Server. To extend privileges to a network:

- Under **Security**, click **Local networks**.
- Click **Add network**.
- Enter the Network Address.
- Enter the Subnet Mask.
- Enter the Router.
- Click **Add**.

36. If the system is connected to the internet, the date and time is set automatically from a Network Time Server. Optionally, you can set the date and time manually:
    - Under **Configuration**, click **Date and Time**.
    - Click **Disable Network Time Server**.
    - Click **Save**.
    - Set the date, time, and time zone.
    - Click **Save**.
37. From the Software Installer Tool, connect to the MXe Server.
38. Re-install and re-license the MCD software on the MXe Server using the first time install procedure.
39. If your network is a dual VLAN network enabled for Quality of Voice, set the Voice VLAN ID:
    - First, reset the Local Network Parameter of the APC-MXe card back to the default IP of 192.168.1.8 (see Table 22)
    - Set the Voice VLAN ID as required (see Table 22)
    - Finally, reset the Local Network Parameter back to the APC-MXe IP address (see Step 27 to Step 31).
40. Launch the 3300 ICP System Administration Tool and enter the following maintenance command:
    - UpgradeBootrom ALL
41. Launch the Group Administration tool and set the system date and time.

Reset MXe Server System IP Address to default

Restore the default System IP address:.

Tip: All of the MXe Server IP addresses must be on the same subnet.

1. Launch the MSL server console and change the System IP address to its default value, 192.168.1.8.
2. Disconnect the MXe Server from the network.
3. Configure a local PC with a static IP address on subnet 192.168.1.0/24 and connect it to the MXe Server. See Table 1 on page 15 for the list of addresses that will be used by the MXe Server.
4. Launch the Mitel Communications blade panel from the Web-based MSL Server Manager interface, and click **Restore Defaults**.
5. Reboot the MXe Server.

Chapter 6

Install and Replace Units

Component Replacement Notes

Use Table 6 on page 44 for controller component options.

For information about component replacement on an MXe or MXe Server, see page 156.

Required Tools

To install or replace components, you require the following tools:

- anti-static strap
- #1 Phillips screwdriver
- #2 Phillips screwdriver
- 3/16 inch socket driver (hex nut)

Required Procedures

Whenever installing or replacing components, you must

1. Power down the controller (see page 127).
2. Remove all cables from controller.
3. Attach an anti-static strap.
4. Remove the controller cover (page 47). For the AX controller, remove the controller card (page 233).
5. After replacing or installing the component, replace cover or controller card.
6. Reconnect cables.
7. Power the controller back up (page 24).

CAUTION: Use proper ESD precautions in all operations described in this chapter.

CAUTION: Use extreme care when handling cards and modules to avoid damaging components.

CAUTION: Remove and install blanking plates as necessary to provide access to slots. Ensure that no openings remain in the controller cabinet after installation. Blanking plates are required for safety, EMC protection, and thermal performance.

CAUTION: To prevent ESD damage to the equipment:
(1) Ensure that the system is grounded before you install a card.
(2) Whenever you handle cards, wear an anti-static strap (attached to the cabinet).
(3) When removing cards from the cabinet, immediately place them in an anti-static bag.

MXe and MXe Server

Identifying the Components

Figure 30, below, shows the MXe II controller without a PATA RAID controller or APC-MXe board installed.

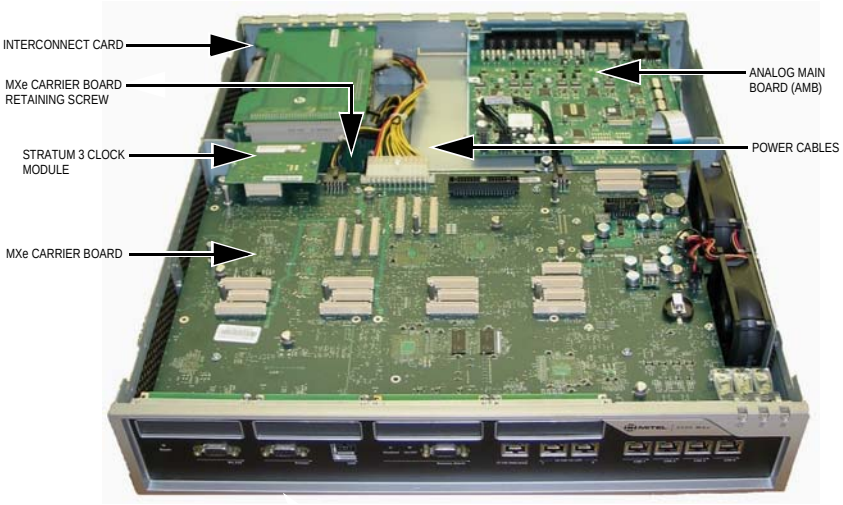


Figure 30: MXe II Controller with Top Cover Removed

Figure 31, below, shows the MXe III controller without a SATA RAID controller installed.

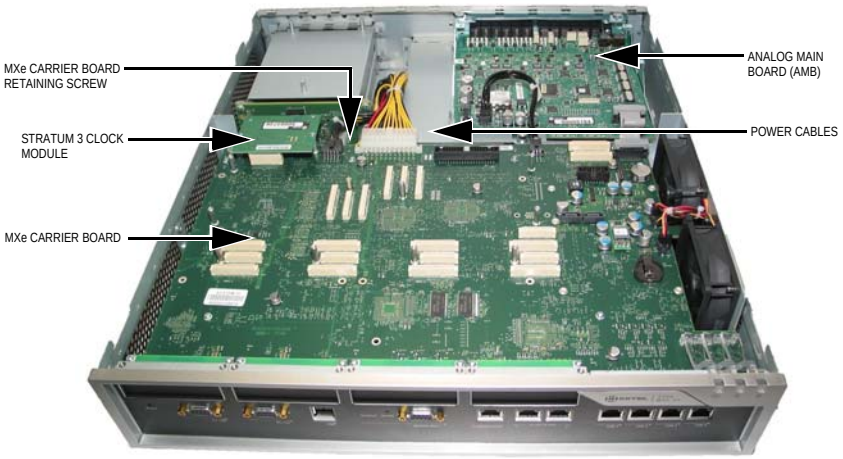


Figure 31: MXe III Controller with Top Cover Removed

Figure 32, below, shows the MXe II PATA RAID controller and pre-formed IDE cable. Use the cable to connect the RAID controller to the carrier board.

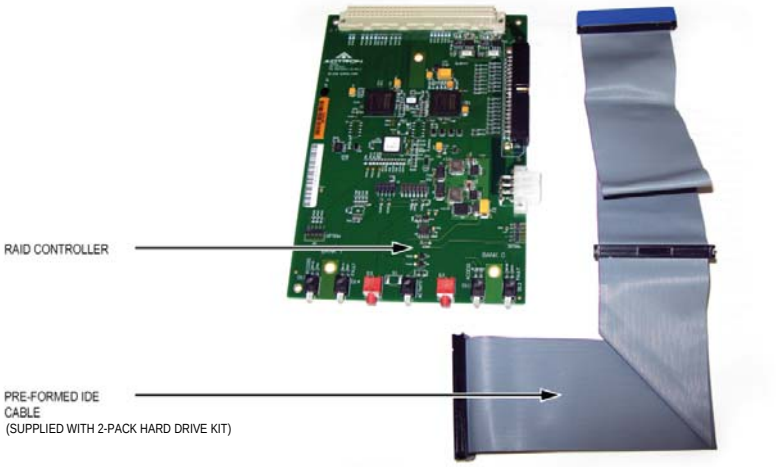


Figure 32: MXe II PATA RAID Controller and Pre-formed IDE Cable

Figure 33 shows the MXe III SATA RAID controller and SATA cables. Use the cables to connect the RAID controller to the hard drive backplane.

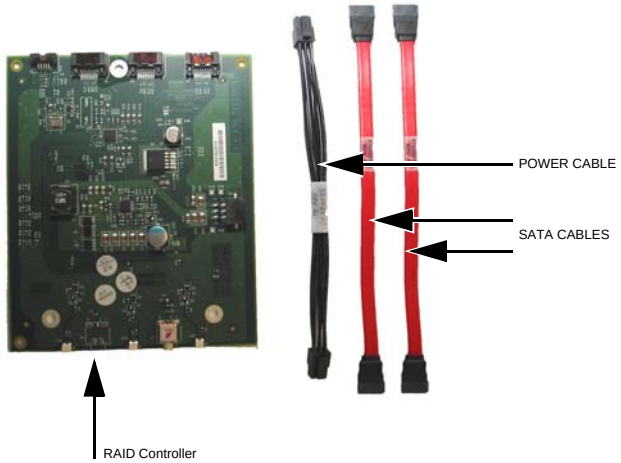


Figure 33: MXe III SATA RAID Controller and SATA Cables

Figure 34 shows the APC-MXe board and its pre-formed IDE cable.

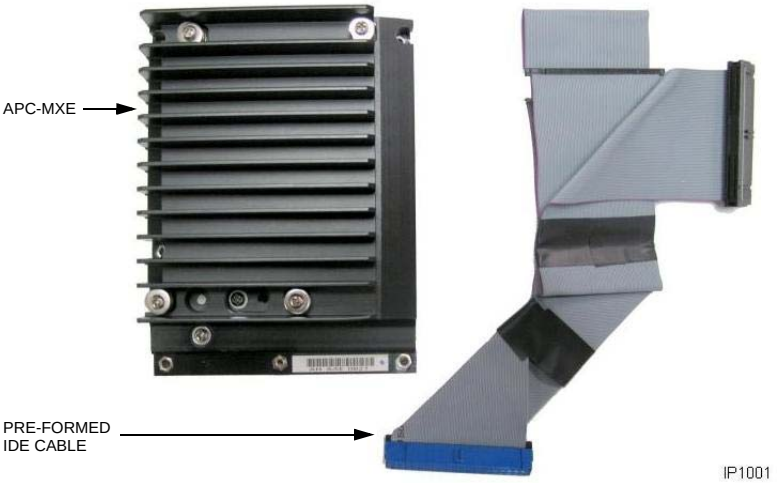


Figure 34: APC-MXe and Pre-formed IDE Cable

Accessing the MXe Carrier Board

Before you can add or replace a component, you must first access the MXe carrier board.

1. Power down the controller and remove the controller cover (see page 47).
2. Attach the anti-static strap to your wrist and connect the clip to the controller chassis.
3. If an Analog Main Board (AMB) is present, disconnect the power cable and ribbon cable that connects the AMB to the MXe carrier board (see Figure 35).

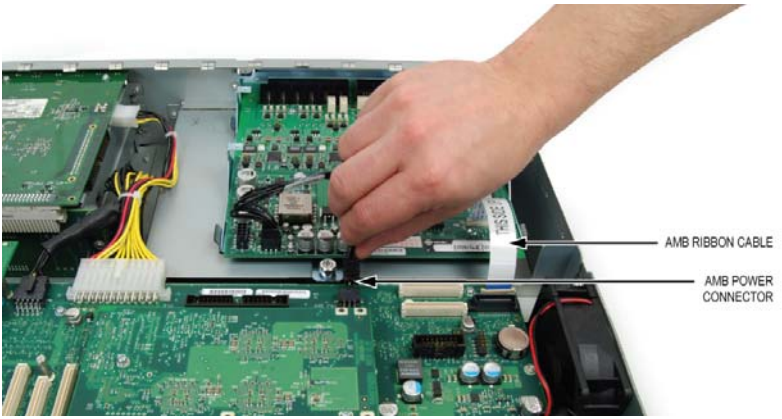


Figure 35: Disconnecting the AMB Power Connector

4. If the controller has an APC-MXe installed, disconnect the blue IDE cable connector from the ETX PATA connector on the MXe II carrier board. If the controller doesn't have an APC-MXe, this cable will not be present (see Figure 36 for the location of the ETX PATA connector).
5. Disconnect the power cables from the MXe carrier board (see Figure 36).

Figure 36: Removing the Power Cable

6. Remove the Stratum 3 clock module and keep the screws.
7. Unfasten the MXe carrier chassis retaining screw (see Figure 37).

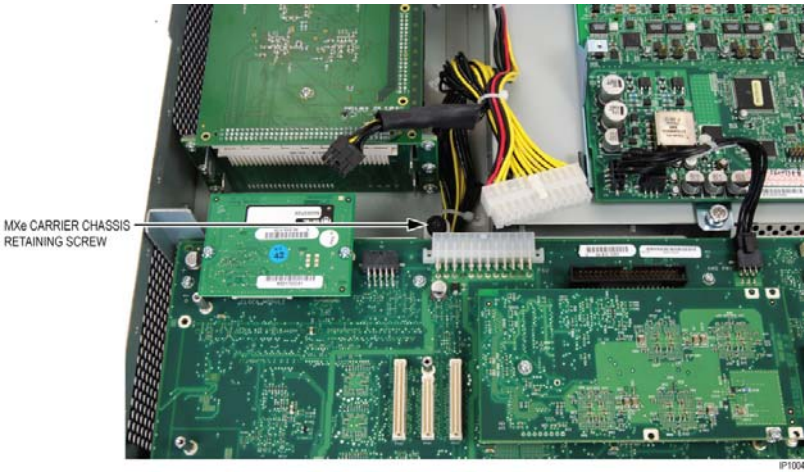


Figure 37: Carrier Chassis Retaining Screw

8. Facing the front of the controller, wiggle the chassis back towards yourself until the chassis is free of the controller cabinet.

9. Tilt the back of the chassis up several inches, reach underneath the MXe carrier board and then do one of the following:

- For the MXe II, disconnect the IDE interconnect cable from the RTC (host) IDE connector (see Figure 38).

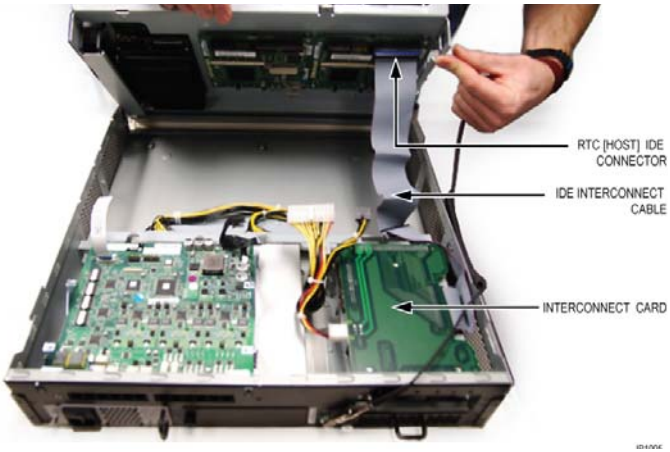


Figure 38: Disconnecting the IDE Interconnect Cable - MXe II

- For the MXe III, disconnect the I2C and SATA cables from the hard drive backplane (or RAID controller if installed), and then disconnect the I2C and SATA cables from the RTC (host) IDE connector (see Figure 39).

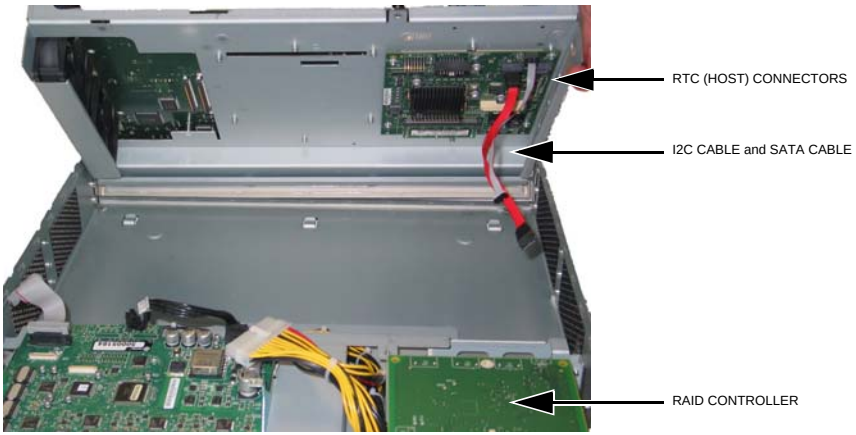


Figure 39: Disconnecting the I2C Cable and the SATA Cable - MXe III

Add or Replace Controller FRUs

See page 377 for part numbers.

Table 23: Field Replaceable Units

Component	MXe Server	MXe II	MXe III	CX/CXi	CX II/ CXi II	AX
DSP Module	pg 166					
Echo Canceller	pg 166					pg 166
Framers						
Dual T1/E1		pg 167				pg 167
T1/E1 Combo		pg 167				
Quad BRI		pg 167				
Dual FIM		pg 166				pg 166
Quad CIM		pg 168				
Stratum 3 Clock Module		pg 169				
System i-Button		pg 170				
Analog Main Board		pg 171		pg 172	pg 174	
Analog Option Board				pg 176	pg 177	
Application Processor Card/Assembly	pg 183			pg 187	pg 193	
E2T or RTC Processor	pg 201					
One Drive (Non-redundant)						
Replace hard drive		pg 210	pg 215	pg 205	pg 207	
Replace SSD		pg 210	pg 215		pg 207	
Two Drives (Redundant)						

Table 23: Field Replaceable Units (continued)

Component	MXe Server	MXe II	MXe III	CX/CXi	CX II/ CXi II	AX
Replace one drive	pg 211		pg 216			
Replace both drives	pg 213	pg 212	pg 217			
Fan Complex	pg 219				pg 221	pg 220
Power Supply Unit		pg 222				pg 222
Redundant Power Supplies	pg 223					pg 223
RAID Controller	pg 224		pg 227			
Controller Card						pg 233
Line Cards						pg 232
Flash Cards						pg 234
Memory Module				pg 236		pg 236

Controller Modules

Adding or replacing controller modules

To add or replace controller modules:

1. Read the notes in this section that apply to the type of module that you are adding or installing before proceeding.
2. Refer to "Determine Controller Module Configuration" on page 39 for appropriate slot location.
3. Remove screws and lock washers and pull up on module to remove it.
4. Remove existing module and replace
   - If adding or replacing a module in an AX front panel, see additional steps below.
   - If a cover plate is attached to the module (for example, DSP module) remove it and install it on the replacement module (see Figure 40).
   - Insert module connector into the module slot connector and seat it firmly into the main chassis board. Secure with screws and lock washers.

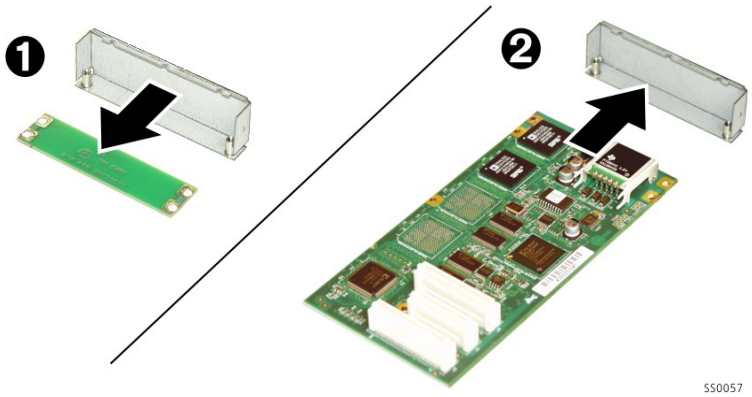


Figure 40: Attaching Cover Plate to the DSP Module

AX Controller

To add or replace controller modules in AX front panel

1. Remove the blanking plate (or the old MMC) from the controller by removing the screws that hold the standoffs to the controller. (The screws are on the back side of the controller card.)
2. Back off the controller faceplate screw nearest the MMC slot a couple of turns (because the screw interferes with the removal/insertion of T1/E1, Quad BRI, Quad CIM, or Dual FIM modules).
3. Slide the blanking plate out of the opening from the back of the controller faceplate.
4. Remove the two standoffs (closest to the face plate) from the blanking plate (or old MMC). Retain the standoffs and screws.
5. Fasten the standoffs to the front of the new MMC.
6. Carefully slide the MMC face plate under the lip of the controller face plate. See Figure 41. Do not push the MMC past the controller face plate as shown in Figure 42.
7. Re-install and/or retighten screws.
8. Continue with procedure as described in the specific FRU instructions

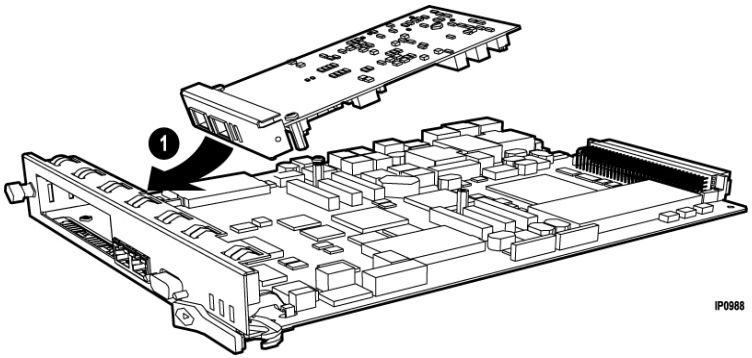


Figure 41: Position module at an angle (AX)

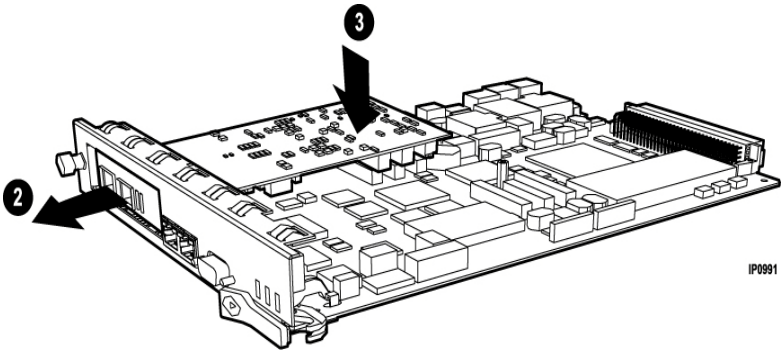


Figure 42: Slide in and seat module (AX)

Controller Module Installation Notes

DSP Module

- Refer to "Increasing DSP Resources" on page 293.
- Make sure that you have sufficient compression licenses before installing DSP modules for compression.

Dual Fiber Interface Module (FIM)

- Ensure that the type of the optical interface matches that of the mating unit (820 nm multi-mode, 1300 nm multi-mode, or 1300 mn single-mode).

Echo Canceller

- The CX, CXi, CX II, CXi II, MX, MXe, MXe Server, and AX contain echo cancellers on the main board that are sufficient to handle normal traffic conditions.

Framers

Embedded T1/E1 (for PRI, T1/D4, or BRI)

- You can add embedded T1/E1 (for PRI, T1/D4, or MSDN/DPNSS) or embedded BRI to a controller by adding one to three framer modules (Dual T1/E1, T1/E1 Combo, or Quad BRI). (See "Hardware Part Numbers" on page 377 for the part number of the Framer Modules.)

- Upgrading to embedded PRI, T1/D4, MSDN/DPNSS, or BRI requires a minimum 300 MHz controller (see "Upgrading to a 700-User Controller" on page 410). To determine the speed of your processor, see “Check Controller Hardware Profile” on page 116.
- The Dual T1/E1 Framer does not support XNET, Min/Max, or NFAS.

Dual T1/E1 Framer

- Each Dual T1/E1 Framer has 2 ports (RJ-45 connectors), each of which can be used for T1/E1 ISDN or T1/D4. The two protocols can operate in tandem on the same Dual T1/E1 Framer with any ISDN variant, i.e. PRI and QSIG.
- T1/D4 provides for digital E&M, digital DID, or digital CO protocols. T1/E1 ISDN provides for DMS-100, DMS-250, NI-2 (Bellcore National ISDN, 5ESS, GTD5), Euro ISDN, 4ESS, Euro-ISDN (CTR4), HKIDAP, and QSIG protocols.

T1/E1 Combo

- The T1/E1 combo module, available only for the CX/CXi and CX II/CXi II controllers at Release 6.0, combines trunking (T1D4 and PRI ISDN/QSIG) and DSP functionality in a single card. The Release 6.0 version of the combo contained a single T1/E1 framer. The module also includes 32-channel Echo Cancellation.
- Supported on the MXe controller.
- Release 7.0 included a resilient connection for the combo. You can connect T1/E1 Combo cards in a primary and a secondary controller, for resilient operation, with a one-to-one RJ-45 cable. Enable the resilient feature in the Digital Links form. Refer to the Resiliency document on Edocs (http://edocs.mitel.com) for instructions on how to configure T1/E1 resiliency.
- Resilient operation requires that both the primary and secondary controllers are running Release 7.0 or later software. The secondary controller may be configured with the new or old version T1/E1 Combo card or a Dual T1/E1 Framer module.

Quad BRI Framer

- BRI (Basic Rate Interface) is a basic ISDN service consisting of two 64 Kbps channels and a single 16 Kbps channel (see page 252 in the Hardware Reference chapter for connection details)
- The Quad BRI Framer is not supported in North America.

- When you remove the Quad BRI Framer module from its packaging. DO NOT move LT/NT jumpers.
- For the T1/E1 Combo, connect the T1 line from the service provider to the RJ45 connector on the T1/E1 combo module. See Table 24 on page 251 for connector pinouts.
- The Quad BRI Framer allows a 1:1 connection to a BRI Central Office or a crossover connection to a BRI telephone. The shielded, twisted pair ISDN cable is connected on either end with pins 3-4, and 5-6. The straight-through cable is used for "T" interfaces to the Central Office and the crossover (with 3-4 and 5-6 crossed at one end) for "S" interfaces to sets.

Quad CIM MMC

- Support for the Quad CIM requires that the 3300 ICP is running software Release 7.1 or later.
- The Quad CIM MMC cannot be installed in an MXe Server.
- The AX, CX, CXi, CX II, and CXi II can accept one Quad CIM MMC.
- All other controllers can accept two Quad CIM MMCs.
- When the Quad CIM MMC is used in a CX, CXi, CX II, or CXi II, only the first three ports are operational.

Stratum 3 Clock Module

To replace the clock module in the CX/CXi, MXe, or MX:

Note: The other controllers use the Stratum 3 Clock, but in each case, the clock is embedded and is not field replaceable. The MXe Server does not use a Stratum 3 Clock.

1. Remove the screws from the clock module.
2. Remove the clock module.
3. Seat the new clock module onto the main board.
4. Replace the screws that you removed from the clock module.

System i-Button/System ID Module

To replace the System i-Button (MXe, CX/CXi, CX II/CXi II, AX)

1. Remove the old system i-Button from the main board. Lift slightly the metal clips that hold the i-Button in place.
2. Insert the system i-Button in the twin tab connector located on the main board (see Figure 43) or on the controller card, for the AX, CX II and CXi II directly behind the external MMC slot position (see Figure 6, Figure 9, and Figure 10 beginning on page 40).

To replace the System ID Module

1. Remove the old System ID module from the main board:
   - **100-user** controller: behind slot 2.
   - **MX** controller: behind slot 4.
   - **LX, 250, or 700-user** controller: between slots 1 and 8.
2. Remove the cover from the new System ID module's connector.
3. Install the new System ID module and secure with the screw provided.

Tip: If you replace the System I-button, you must program the options (see page 29) and then restore the database (see page 130).

Figure 43: Installing the System i-Button

Analog Main Board

MXe

To replace the analog main board (AMB) in an MXe:

1. Remove the narrow flex cable on the AMB (J4) by flipping up the clip on the connectors at each end of the cable (prior to Rel 7.1 version) or remove the ribbon cable on the AMB (J8) (see Figure 44).

Tip: A replacement AMB ships with a connector-less flex cable that you will discard for the MXe controller.

2. Loosen the captive screw on the AMB.
3. Remove the AMB.
4. If you are replacing the AMB with an AMBv3, the replacement kit will include a new label that identifies the protected ports.
   - If your MXe still has the old AMB label, apply the new label over the existing one.
   - If your MXe has the new AMB label, discard the label.
5. Place the new AMB on the power supply carrier and slide the port interfaces through the slots at the rear of the controller.
6. Secure the AMB to the carrier with the captive screw provided.
7. **AMB 2:** Attach the connector-less flex cable to the controller by lifting up the clip and inserting the cable vertically into the connector. Push the clip down to secure the cable.
8. **AMB 3:** Attach the ribbon cable to the controller and the AMB.

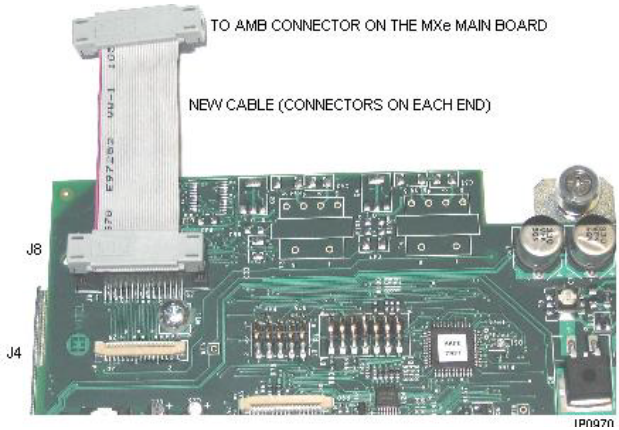


Figure 44: AMB with new cable for MXe Controller

CX/CXi

To add or replace the analog main board (AMB) in a CX or CXi:

1. Remove the screw that secures the faceplate to the back panel.
2. Remove the Analog Option Board, if one has been installed.
3. Disconnect the power supply cable on the AMB.
4. Remove the narrow flex cable on the AMB (not from the main board) by flipping up the clip on the connectors at each end of the cable.
5. Remove the Analog Main Board.
6. If you are replacing the AMB with an AMBv3, the replacement kit will include a new label that identifies the protected ports. Discard the label.
7. Insert the new Analog Main Board.
8. Replace the narrow flex cable by sliding it under the guides on the side and up into the connector. Flip the clip down to secure the cable.
9. Reconnect power cable to the new AMB.

10. Replace the Analog Option Board (if previously removed).

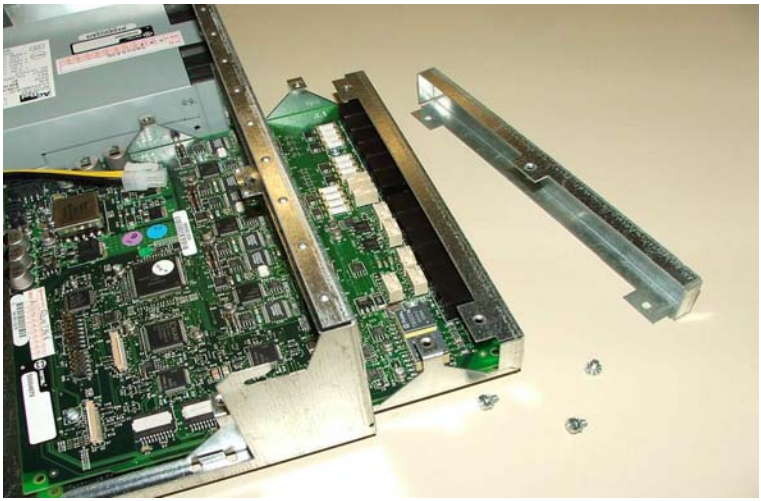


Figure 45: CX/CXi, Insert the Analog Main Board

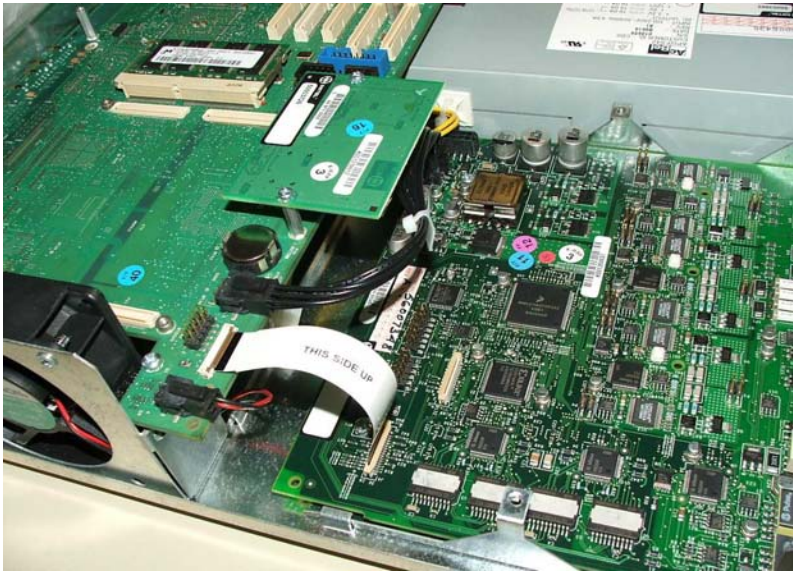


Figure 46: CX/CXi AMB ribbon cable

CX II/CXi II

To replace the AMB in a CX II/CXi II:

1. Power down the controller and remove the controller cover; see page 127 for procedure.
2. Remove the Analog Option Board, if one has been installed. Remove by reversing the steps on page 177 of this document.
3. Remove the AMB as follows referring to Figure 47:
   - Disconnect the power supply cable on the AMB.
   - Disconnect the ribbon cable on the AMB (not from the main board).
   - Unfasten the four screws holding the AMB to the controller chassis.
   - Remove the AMB by pushing it toward the front on the controller, and then tipping it upwards.
4. Insert the new AMB and secure it to the chassis using the supplied screws.
5. Reconnect ribbon cable.
6. Reconnect the power cable to the new AMB.
7. Replace the Analog Option Board (if previously removed).
8. Configure the board. See "Configure Embedded Analog Boards" on page 181..

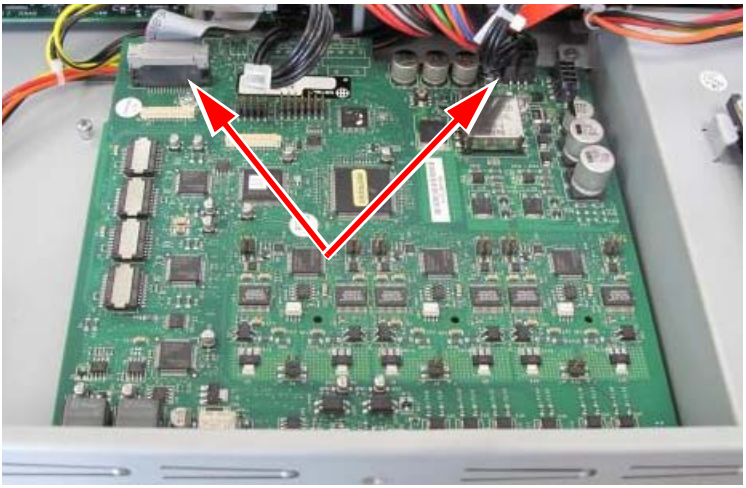


Figure 47: AMB - Disconnect Cables

MX

To replace the analog main board in an MX:

1. Remove the Analog Option Board, if one has been installed, by reversing the installation procedure (page 180).
2. Disconnect the three power supply connectors.
3. Remove the ribbon cable by flipping up the clip on the connectors at each end of the cable (see Figure 48).

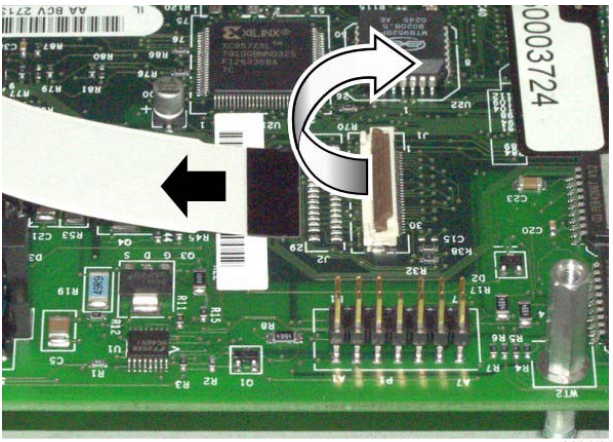


Figure 48: Analog Main Board Ribbon Cable

4. Remove the four standoffs and the two screws at the front of the board (refer to Figure 55 on page 181).
5. Remove the two screws from the hold-down for the Amphenol cable assembly on the back of the unit.
6. Remove the clock module, behind MMC Slot 2.
7. Remove the Analog Main Board.
8. Insert the new Analog Main Board.
9. Replace the two screws in the hold-down for the Amphenol cable assembly on the back of the unit.
10. Replace the two screws at the front of the board and the four standoffs.
11. Replace the ribbon cable by sliding it under the guides on the side and up into the connector. Flip the clip down to secure the cable.
12. Replace the three power supply connectors.

Analog Option Board

CX/CXi

Add an AOB to a CX/CXi controller to increase LS CLASS circuits from 6 to 12 and ONS CLASS circuits from 4 to 8 (see page 256).

To add or replace an AOB in a CX/CXi:

1. Remove the blanking panel from the back of the controller.
2. Insert the replacement faceplate into the back of the controller and attach it with screws (1). See Figure 49 on page 177.
3. Place the AOB on a flat surface.
4. Attach the flex and power cables. To attach the flex cable, lift up on the tabs at the end of the connector to loosen it, insert the cable label side down, and then press down on the tabs to tighten connector (2).
5. Lower the AOB into place and attach it with the supplied screws (3).
6. Connect the other ends of the flex cable and power cable where indicated in Figure 49. The horizontal flex cable connector is hinged: flip up to loosen it, insert the cable, and then press down to tighten (4).
7. Replace the top cover and power up the controller.
8. In the System Administration Tool, go the **Analog Services Units** form.
9. Select Unit 4 and click **Modify**.
10. Select **3300 Expanded Analog** and click **Save**.

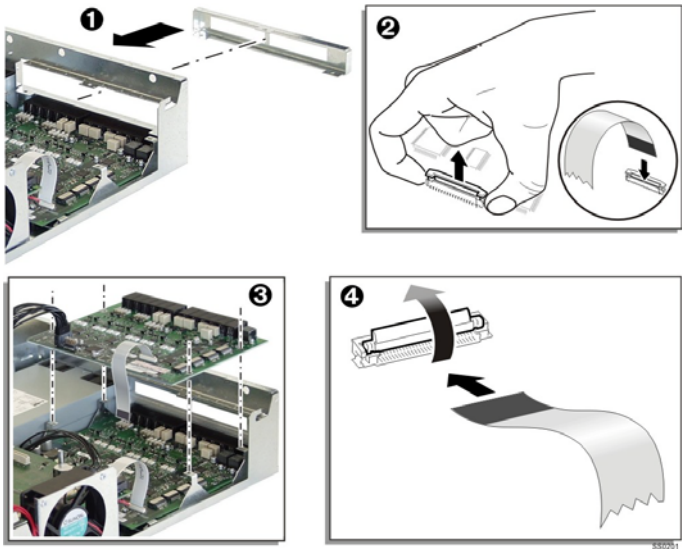


Figure 49: Screws and Standoffs on the Analog Option Board

CX II/CXi II

Add an AOB to a CX II or CXi II controller to increase LS CLASS circuits from 6 to 12 and ONS CLASS circuits from 4 to 8 (see page 256).

To add or replace an AOB in a CX II/CXi II:

1. Power down the controller and remove the controller cover; see pages 47 and 127.
2. If adding the AOB, remove the blanking panel from the back of the controller.

Figure 50: Remove Blanking Panel

3. Remove the four screws that secure the Analog Main Board (AMB) to the bottom of the chassis.
4. Replace the screws removed above with the standoffs included with the AOB.
5. Attach the flex and power cables supplied with the AOB to the AMB.
   - To attach the flex cable, lift up on the tabs at the end of the connector to loosen it, insert the cable label side up, and then press down on the tabs to tighten the connector.

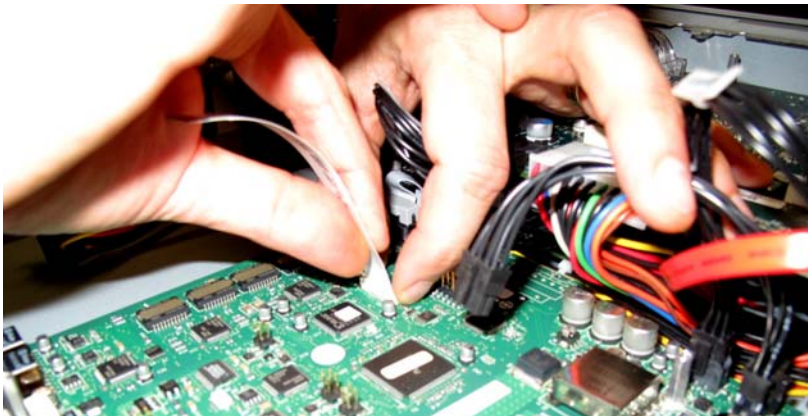


Figure 51: Attach Flex cable to AMB

6. Connect the power cable to the connector on the AMB closest to the edge of the board.

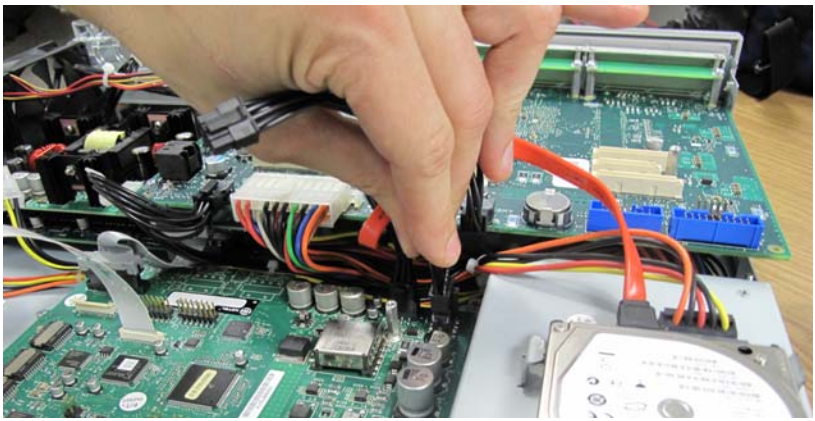


Figure 52: Attach Power cable to AMB

7. Attach the mounting plate to the standoffs and the back panel of the controller using the supplied screws.

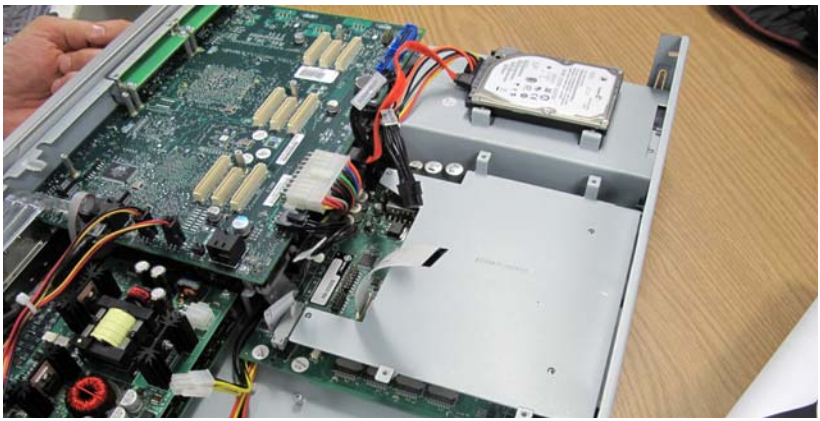


Figure 53: AOB Mounting Plate in Position

8. Lower the AOB on to the mounting plate and secure it with the four smaller screws supplied with the AOB.
9. Connect the other ends of the flex cable and power cable where indicated in Figure 54 (page 179). To attach the flex cable, lift up on the tabs at the end of the connector to loosen it, insert the cable label side up, and then press down on the tabs to tighten the connector.

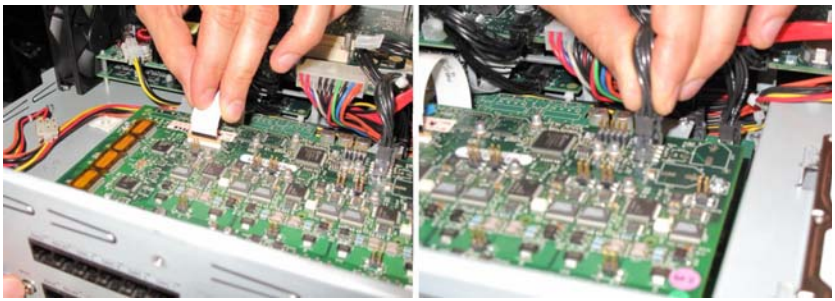


Figure 54: Attach Flex cable and Power Cable to AOB

10. Replace the top cover and power up the controller.
11. In the System Administration Tool, go the **Analog Services Units** form.
12. Select Unit 4 and click **Modify**.

13. Select **3300 Expanded Analog** and click **Save**.
14. Configure the board. See "Configure Embedded Analog Boards" on page 181.

MX

Install an AOB to increase LS CLASS circuits from 6 to 12 and ONS CLASS circuits from 2 to 4 (see page 253).

To add or replace an AOB in an MX:

1. Remove the four screws from the back portion of the Analog Main Board (AMB). See Figure 55 (page 181).
2. Install and secure the standoffs that ship with the Analog Option Board.
3. Insert the Analog Option Board onto the AMB. Ensure that it's well-seated in its socket.
4. Attach the four screws that you removed from the AMB.
5. In the System Administration Tool, go the **Analog Services Units** form.
6. Select Unit 4 and click **Modify**.
7. Select **3300 Expanded Analog** and click **Save**.

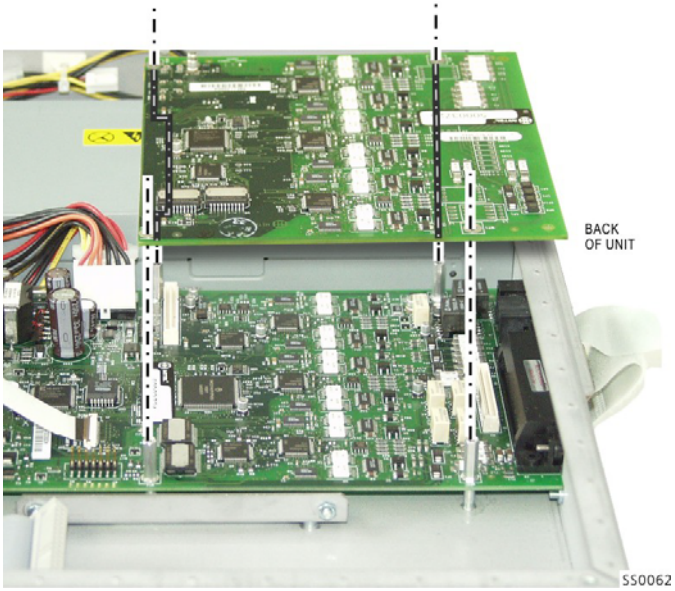


Figure 55: Screws and Standoffs on the Analog Option Board

Configure Embedded Analog Boards

To configure controllers with embedded analog boards:

1. Complete telephony cabling for embedded analog (see Table 29 on page 254).
2. Complete the Music on Hold and Paging cabling if required (see Table 27 and Table 28 on page 254).
3. Connect power to the controller. The controller detects the Analog Main Board and Analog Option Board and the software downloads.

CAUTION: Rebooting the controller before the embedded analog software is downloaded can render the analog boards inoperable.

Tip: Verify, in the System Administration Tool, that 3300 Embedded Analog or 3300 Expanded Analog appears as the Installed Type in the Analog Services Units form.

4. Using the System Administration Tool, program the analog settings on the controller. Refer to the System Administration Tool Online Help for instructions.

Tip: The ONS circuits provide positive disconnect for support of applications such as door phones.

Tip: Use the LSMeasure Tool to determine the line settings for LS trunks on an Analog Board, Universal ASU, or ASU II (refer to the System Administration Tool online help).

Application Processor Card

APC-MXe Server

The Application Processor Card (APC-MXe) is an embedded PC card that is installed in the MXe Server. This section provides instructions on how to

- replace an APC-MXe
- replace the APC-MXe battery.

Tip: Before replacing the APC card, check the battery on your current card in case it is only the battery that needs replacing.

To add or replace an APC-MXe in an MXe Server

1. Access the MXe carrier board (see page 159).
2. Turn the MXe carrier chassis over. The APC-MXe is located on the underside of the MXe carrier board next to the two system fans (see Figure 56).

Figure 56: APC-MXe on MXe Carrier Board

3. Using a Phillips #1 screwdriver, remove the five mounting screws from the APC-MXe and gently detach the faulty APC-MXe from the MXe carrier board and high-density connector. Retain the screws.

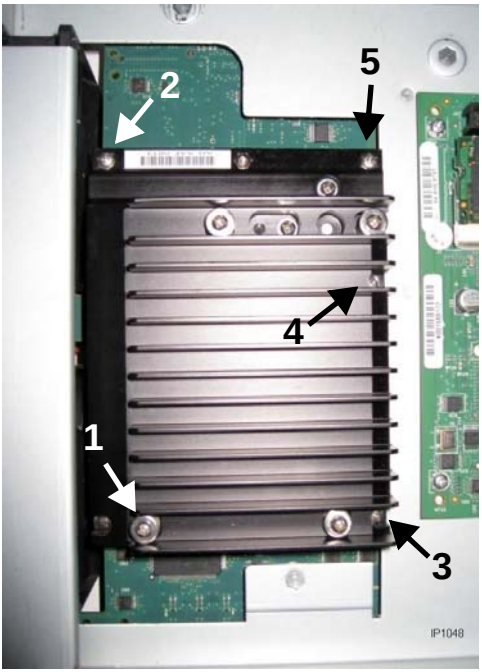


Figure 57: Removing the APC-MXe Retaining Screws

4. Place the faulty APC-MXe into an anti-static bag.
5. Remove the replacement APC-MXe from its anti-static bag.
6. Align the mounting holes on the APC-MXe heatsink with the standoffs on the MXe carrier board. Ensure that the APC-MXe is properly seated and aligned in the high-density connectors.
7. Press the APC-MXe module into the high-density connectors on the MXe carrier board (see Figure 58).

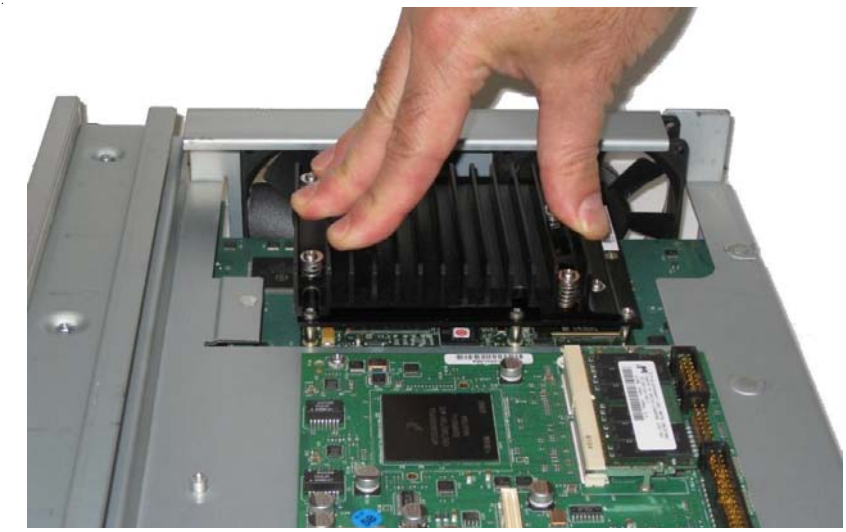


Figure 58: Installing an APC-MXe in the MXe Server

8. Install the five mounting screws into the holes on the APC-MXe heatsink but do not tighten.
9. Tighten the retaining screws in the following order, referring to Figure 57 for screw numbers:
   - Screws #4 and #5 by alternating between the screws
   - Torque screws #1 and #2
   - Torque screw #3

CAUTION: Do not over tighten the screws.

10. Turn the MXe carrier chassis over and slide it back into position. Ensure that the metalwork beneath the faceplate engages the main chassis. Tighten the chassis retaining screw (see Figure 37 for location of the chassis retaining screw).
11. Replace the APC-MXe battery (see page 186). A new battery is shipped with every replacement APC-MXe. Ensure that you replace the existing battery with the new one.
12. Reconnect the power cables to the MXe carrier board.

13. Reconnect the blue IDE cable connector to the ETX PATA connector on the MXe carrier board (see Figure 36 for the location of the ETX PATA connector).
14. If an AMB is present, reconnect the power and ribbon cables between the AMB and the MXe chassis board.
15. Replace the top cover. Using the #1 Phillips screwdriver, tighten the screw that fastens the top cover to the chassis.
16. Break the ARID/Hardware ID association in the AMC. (See the AMC Licensing Help for instructions.) The software is still installed but will have to be re-licensed after you have replaced the faulty card.
17. Re-license the Mitel Communications Director software by following the procedure at "Enable Licenses and Options" on page 29.

To replace the APC-MXe Battery

CAUTION: Replace the APC-MXe battery with a Panasonic CR2032 battery only. Do not dispose of batteries in a fire as they may explode. Batteries may also explode if damaged. Dispose of batteries according to local regulations. Please recycle when possible.

1. Power down the controller and remove the controller cover; see pages 47 and 127.
2. Remove the dead battery from the coin cell holder. The battery is located on the MXe carrier board next to the fans. To remove the battery:
   - Lift the clip that holds the battery in place with the index finger of one hand
   - Pry up the battery and slide it out from its holder as shown in Figure 59.

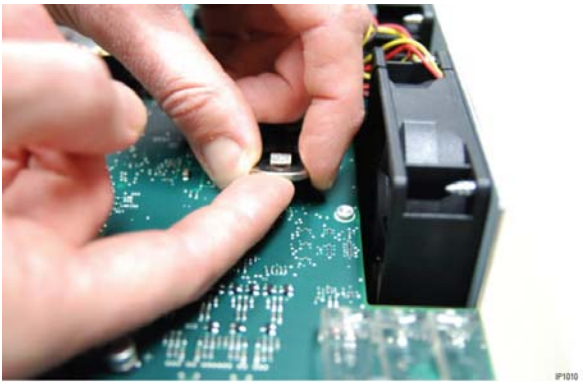


Figure 59: Removing the Battery

3. Install the new battery with "+" sign facing up towards you.
   - Lift the clip
   - Slide the battery into the coin cell holder.
4. Replace the top cover. Using the #1 Phillips screwdriver, tighten the screw that fastens the top cover to the chassis.

APC-CX(i)

The optional Application Processor Card (APC-CX(i)) allows the system to host the Mitel Standard Linux (MSL) that can run applications such as Mobile Extension and Teleworker Solution. Each of the applications will be released with guidelines defining conditions, performance, and installation combinations. For information on how to program and use software blades and services, refer to the MSL documentation on Edocs (http://edocs.mitel.com).

Note: You can install the APC-CX(i) in CX and CXi controllers that have Release 7.1 and higher software.

Note: Only CX PN 50005096 and CXI PN 50005097 support the APC-CX(i).

After you install the APC-CX(i), install the APC hard drive, and then install the Mitel Standard Linux software. Refer to “Installing MSL Software on APC (CX/CXi) or APC-CX(i) II (CX II/CXi II)” on page 104.

To add or replace the APC-CX(i):

CAUTION: Use ESD straps when handling the APC.

1. Remove the controller, hard drives, and APC-CX(i) from their packaging.
2. Remove the top cover of the controller (Refer to the Release 8.0 Technician's Handbook for instructions).
3. Place the APC module on the main board connectors. The connectors are spaced irregularly to assist in alignment. Orient the module as show in Figure 60.

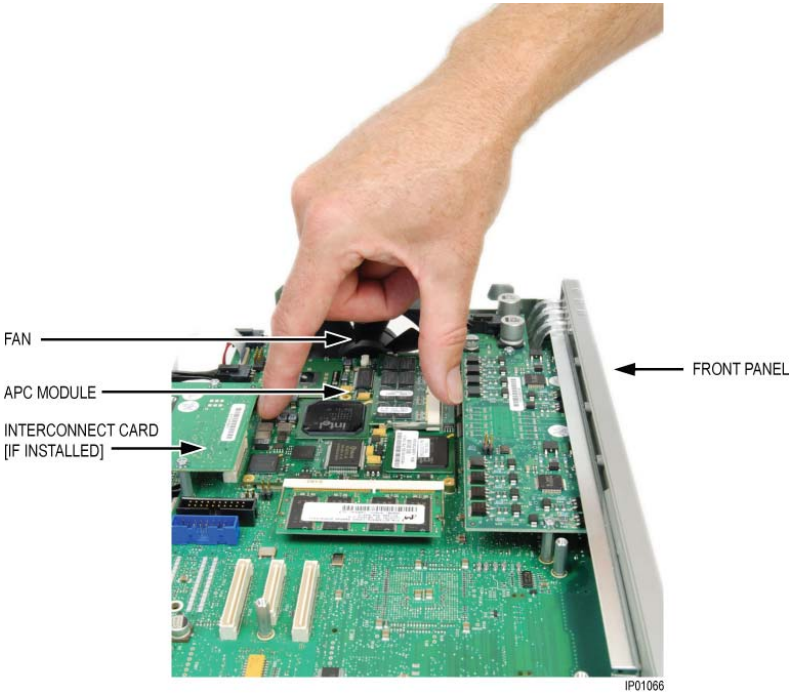


Figure 60: Seat APC Module Connectors onto Main Board Connectors

4. To seat the connectors, grasp the APC Module with your index finger and thumb and press down firmly on edges. You should feel the connectors seat together.

Tip: To ensure that the APC-CX(i) module is seated securely, press down on it over each of the four connectors, one at a time. Once the APC is properly installed, its four corners will rest against the standoffs located at each corner of the APC.

5. Prepare the heat spreader for installation by removing the blue plastic protective strips from the adhesive heat pads (see Figure 61).

Note: When you remove the blue plastic protective strips use a quick lifting motion instead of peeling the strip off the heat pad.

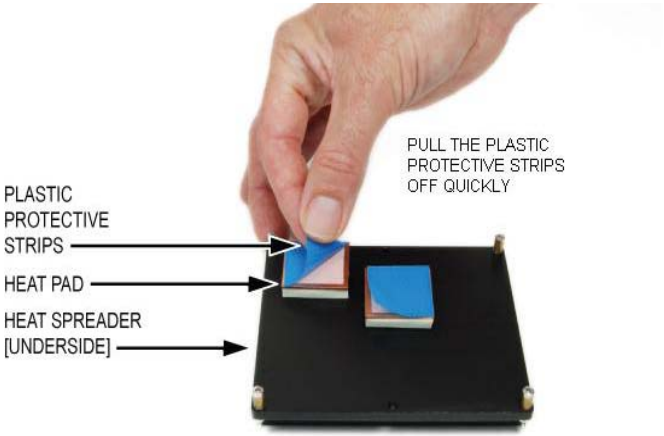


Figure 61: Removing Protective Strips from Heat Pads

6. Place the four screws (supplied) in the heat spreader, and lower the heat spreader onto the APC as shown in Figure 62. Align the cutout on the heat spreader above the memory modules on the APC.

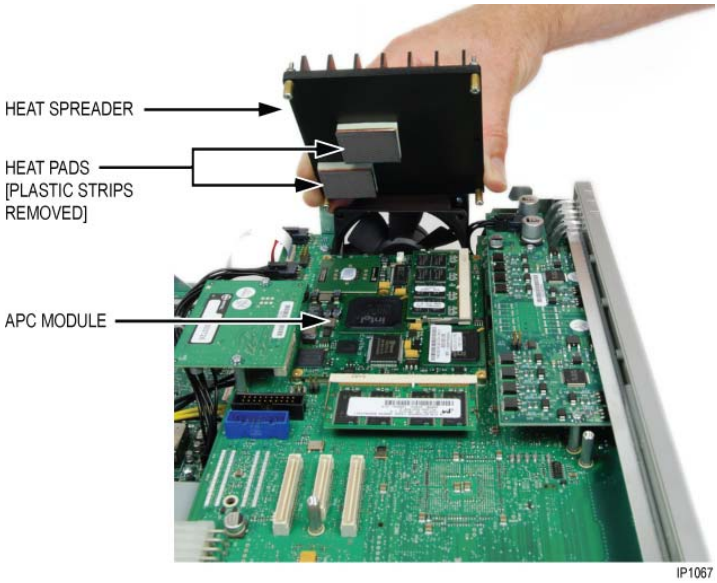


Figure 62: Positioning the Heat Spreader on the APC Module

7. Tighten the screws in an alternating pattern until they are snug. Do not over-tighten.

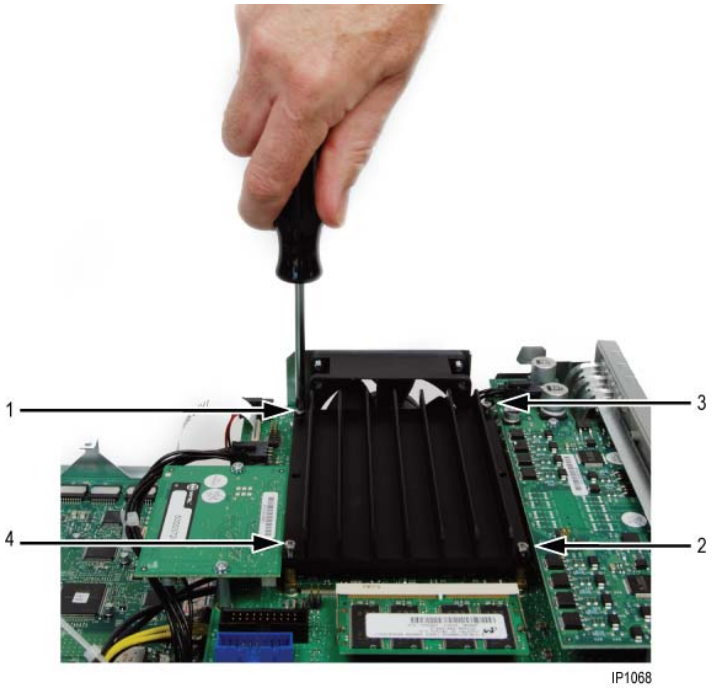


Figure 63: Tightening the Screws

8. Slide the bracket back into the chassis, and fasten the screws connecting the bracket to the back of the controller.

Tip: In the CX, there is no internal connection between the controller and the APC-CX(i) so you must connect both the 10/100 LAN port and the 10/100 ETX port (on the front panel of the CX) to the LAN.

APC Hard Drive (CX/CXi)

If you are installing the optional Application Processor Card in a CX or CXi controller, then you must also install a hard drive to support the operating system and applications of the APC-CX(i). If you are replacing an APC hard drive with one that does not have the MSL software installed, refer to “Installing MSL Software on APC (CX/CXi) or APC-CX(i) II (CX II/CXi II)” on page 104.

To install the APC hard drive in a CX/CXi:

1. Unplug the ribbon cable and the power cable from the old hard drive.
2. Remove the screws connecting the bracket to the back of the controller, then slide the bracket forward and remove it.
3. If a system hard drive is already installed in the upper bracket position, unscrew it from the bracket and move it to the lower bracket position. The power and IDE cables can remain connected.
4. Lower the APC hard drive into the upper bracket position. Ensure that the hard drive jumpers are set to master.
5. Secure the hard drives to the bracket with the screws provided.
6. Connect the power and IDE cables to the corresponding connectors on the hard drive and main board. The cables are keyed for proper connection (see Figure 64).

Tip: Connect the System hard drive IDE cable to the main board connector labeled MPC8270 HARDDRIVE. Connect the APC hard drive IDE cable to the main board connector labeled ETX HARDDRIVE.

7. Slide the bracket back into the chassis, then fasten the screws connecting the bracket to the back of the controller.

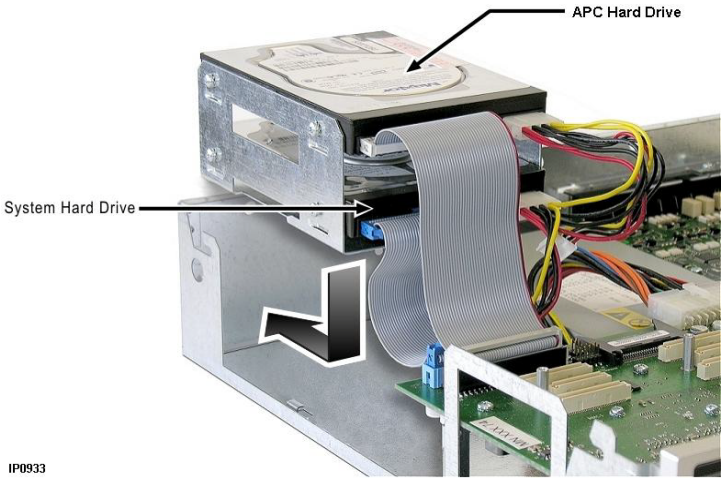


Figure 64: Connecting cables to APC-CX(i)

APC-CX(i) II Assembly

The APC-CX(i) II Assembly is an embedded PC with support for USB, VGA, RS-232,10/100/1000-base-T Ethernet and SATA hard disk drives that can be installed in the CX II/CXi II. This section provides instructions on how to

- install an APC-CX(i) II Assembly
- replace the APC-CX(i) II hard disk drive
- replace the APC-CX(i) II battery.

Tip: Although the battery has an operational life of 5-7 years, should the APC-CX(i) II develop symptoms of time and date loss and CMOS memory errors, first change the battery. Then, If the symptoms persist, replace the APC-CX(i) II Assembly.

The APC-CX(i) II Assembly is shipped mounted on a carrier board with a factory-installed hard disk drive. Figure 65 (page 193) shows the contents of the kit. (The hard disk drive is mounted on the underside of the APC-CX(i) II Assembly and not visible.) Confirm that all parts are present before proceeding with installation.

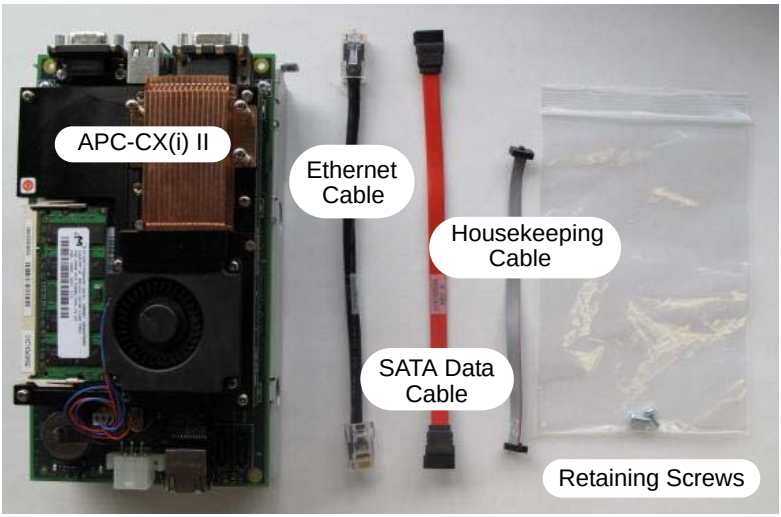


Figure 65: APC-CX(i) II Assembly Kit Components

To install an APC-CX(i) II Assembly in a CX II/CXi II:

1. Power down the controller and remove the controller cover; see pages 47 and 127.
2. Using diagonal cutters, clip the tie-wrap holding the power cables to the tie-wrap base. Take care to avoid cutting the cables; see Figure 66. (Note: Location of tie-wrap base may vary on your controller.)

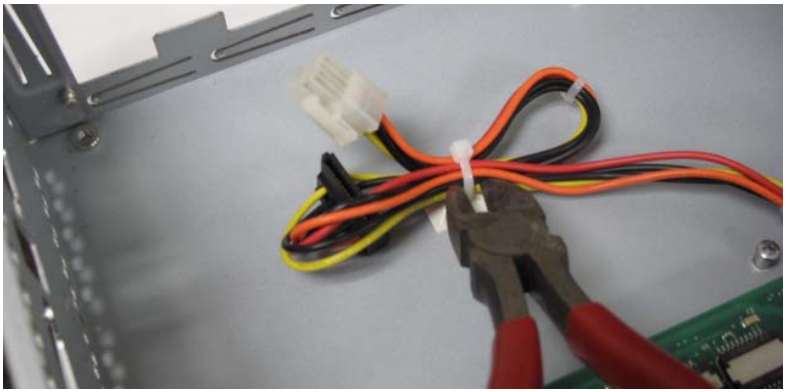


Figure 66: Clipping tie-wrap

3. Remove the APC-CX(i) II Assembly from the anti-static bag.
   - Before seating the assembly in the chassis, connect the following cables, referring to Figure 67 (page 195) for connector locations. Only some of the connections are made in this step; the remaining are made after the assembly is seated. Note that the SATA and housekeeping cables are keyed for proper connection.
   - SATA power cable to the hard disk drive; (1) in Figure 67 (page 195)
   - 6-pin power connector to the APC-CX(i); (2) in Figure 67 (page 195)
   - SATA data cable from hard disk drive to SATA 0 port on the APC-CX(i) II; (3) in Figure 67 (page 195)
   - one end of the housekeeping signal cable to the APC-CX(i) II; (4) in Figure 67.

- one end of the Ethernet cable to the Ethernet jack on the APC-CX(i) II; (5) in Figure 67 (page 195).

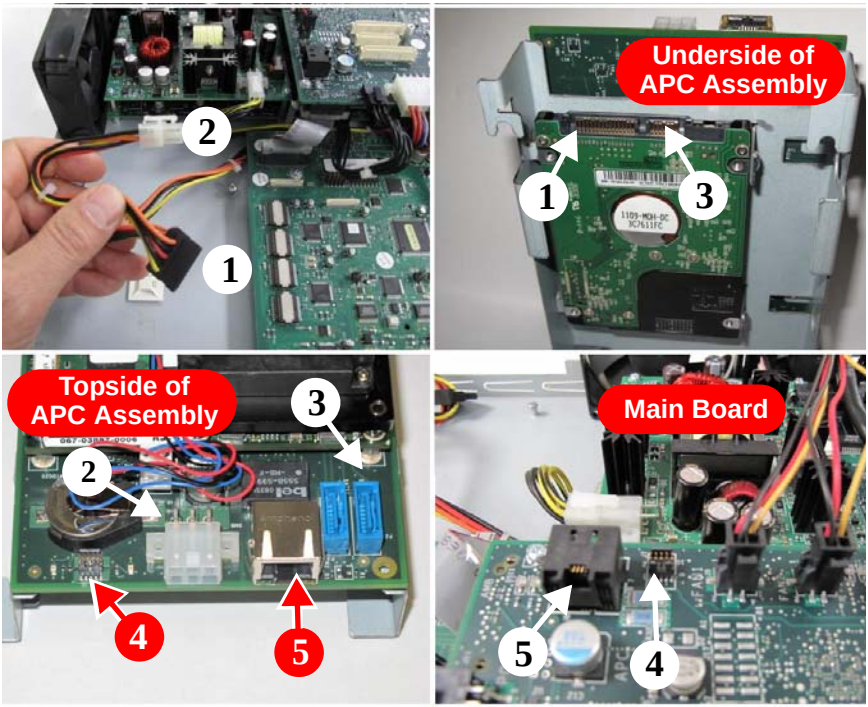


Figure 67: Connect Power and SATA Data Cables

4. Before installing the APC-CX(i) II Assembly into the controller chassis, note the shoulder bolts on the bottom of the controller chassis and the notches in the APC-CX(i) II mounting bracket. The bolts and notches

mate to secure the APC-CX(i) II Assembly to the controller. Two additional screws secure the assembly through holes in the controller back panel.

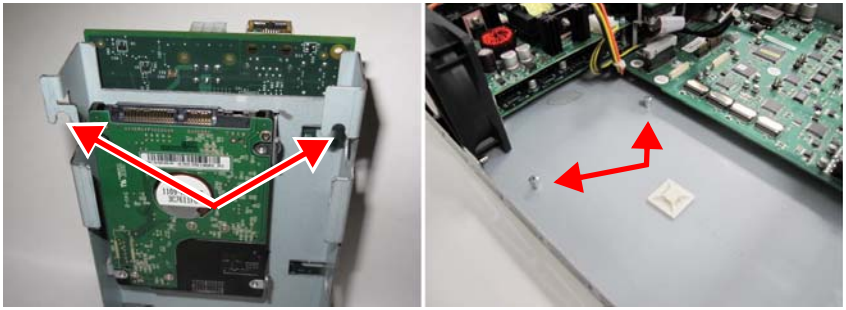


Figure 68: Notches and Shoulder Bolts

5. Lower the APC-CX(i) II Assembly into the controller with the VGA, USB, and RS-232 connectors facing their respective openings in the back panel of the controller.
6. Align the assembly to mate the shoulder bolts and mounting bracket notches.
7. Using a Phillips #1 screwdriver and the supplied screws, fasten the APC-CX(i) Assembly to the controller through the two retaining holes in the back panel.

Figure 69: Retaining Hole Locations

8. Complete the remaining cable connections as follows (refer to Figure 67 (page 195) above for connector locations):

- Connect the loose end of the Ethernet cable to the Ethernet jack on the APC-CX(i) II Assembly to the corresponding jack on the main board; (5) in Figure 67 (page 195).
- Connect the loose end of the housekeeping signal cable on the APC-CX(i) II Assembly to the corresponding connector on the main board. The connectors are keyed for proper connection; (4) in Figure 67 (page 195).

  Ensure that the housekeeping cable goes over the Ethernet cable as shown in Figure 70. This is to avoid damage to the cable from heat produced by the nearby transformer.

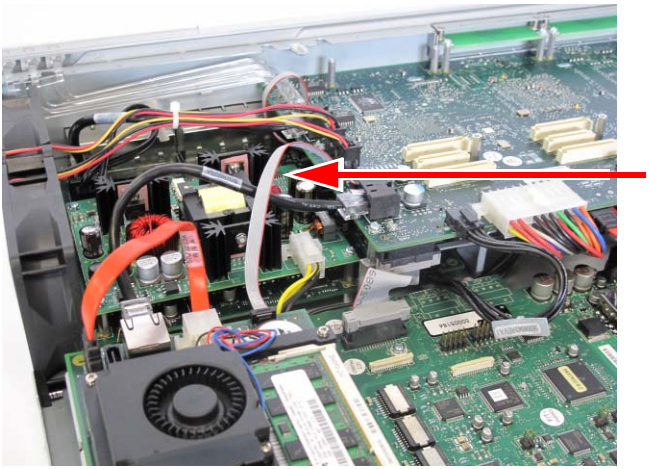


Figure 70: Cable Routing

9. Remove the blanking plate from controller cover to expose the APC-CX(i) II connectors.

Figure 71: Remove Blanking Plate

10. Replace the controller cover.

To replace the APC-CX(i) II hard disk drive:

1. Power down the controller and remove the controller cover; see pages 47 and 127.

2. Remove the APC-CX(i) II Assembly by reversing the steps on page 194 of this document.

3. Turn the assembly over.

4. Remove the two retaining screws; see Figure 72.

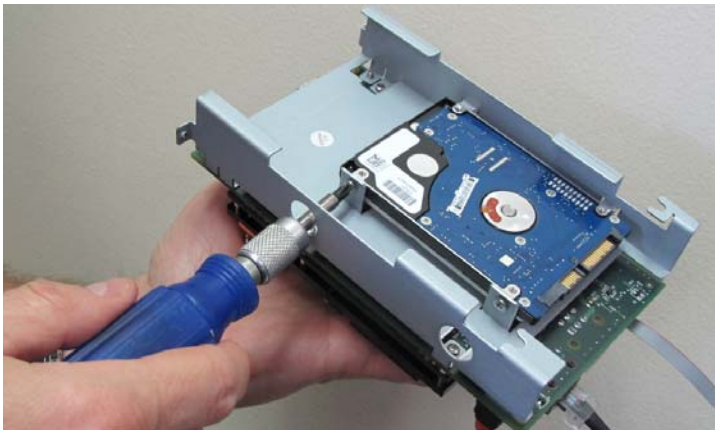


Figure 72: APC-CX(i) II Hard Disk Drive Removal

5. Place the faulty hard disk drive into an anti-static bag.
6. Remove the replacement APC-CX(i) II hard disk drive from its anti-static bag.
7. Install and secure the replacement hard disk drive in the orientation as shown in Figure 72 (page 199).
8. Reconnect the cables.
9. Replace the cover.
10. Reinstall the MSL software. See “Installing MSL Software on APC (CX/CXi) or APC-CX(i) II (CX II/CXi II)” on page 104 of this document.

To replace the APC-CX(i) II Battery:

CAUTION: Replace the APC-CX(i) II battery with a Panasonic CR2032 battery only. Do not dispose of batteries in a fire as they may explode. Batteries may also explode if damaged. Dispose of batteries according to local regulations. Please recycle when possible.

1. Power down the controller and remove the controller cover; see pages 47 and 127.
2. Remove the dead battery from the coin cell holder. The battery is located on the APC-CX(i) II assembly next to the housekeeping cable connector. To remove the battery:

- Lift the clip that holds the battery in place with the index finger of one hand

CAUTION: Lift the clip just enough to slide the battery out. Forcing the clip up too far could cause damage requiring replacement of the entire assembly.

- Pry up the battery and slide it out from its holder as shown in Figure 59.

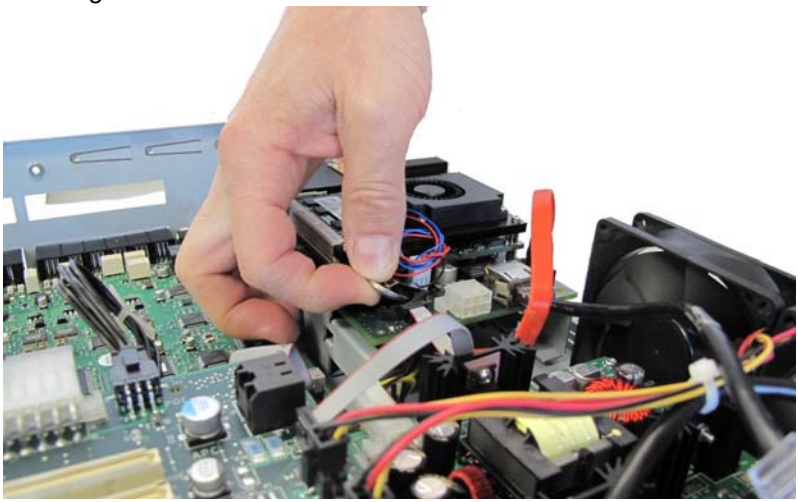


Figure 73: Removing the Battery

3. Install the new battery with "+" sign facing up towards you.
   - Lift the clip
   - Slide the battery into the coin cell holder.
4. Replace the controller cover.

E2T or RTC Processor

Tip: Refer to the *3300 ICP Engineering Guidelines* to determine when a second processor is necessary in the MXe.

Tip: The MXe Server ships with both E2T and RTC as standard equipment.

CAUTION: If you are replacing an RTC in an MXe or MXe Server running 8.0+ software, you may need to change the bootline from /partition1/RTC8260 to /partition4/RTC8260.

To add or replace an E2T or RTC processor in an MXe or MXe Server:

1. Access the main board; see “Accessing the MXe Carrier Board” on page 159.
2. Tilt the back of the chassis up several inches, reach underneath the MXe carrier board and then do one of the following:
   - For the MXe II, disconnect the IDE interconnect cable from the RTC (host) IDE connector (see Figure 74).

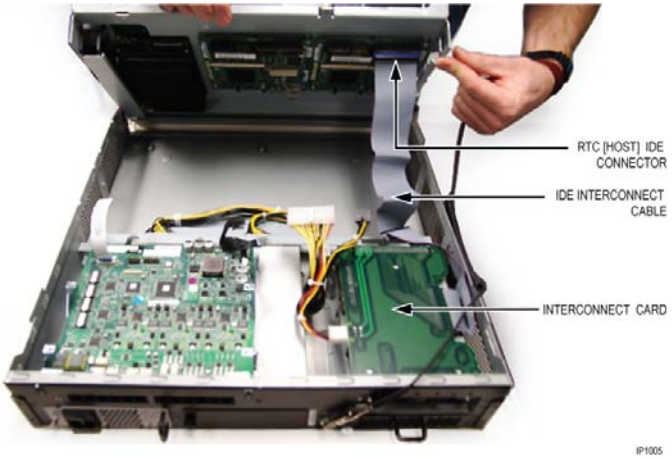


Figure 74: Disconnecting the IDE Interconnect Cable - MXe II/Server

   - For the MXe III, disconnect the I2C and SATA cables from the hard drive backplane (or RAID controller if installed), and then

disconnect the I2C and SATA cables from the RTC (host) IDE connector (see Figure 75).

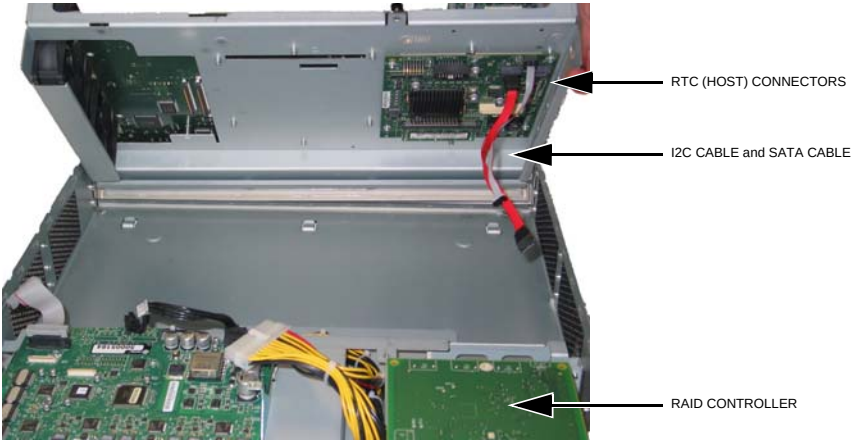


Figure 75: Disconnecting the I2C Ribbon Cable and the SATA Cable - MXe III

3. Set the main board on a flat surface with the underside facing up. See Figure 76 on page 203.
4. Remove the four screws and lift the E2T or RTC from the main board.
5. Seat the new card onto the main board and secure with four screws.

Note: Ensure that you install the correct E2T / RTC card for your controller. Different cards are available depending on whether you have an MXe III or an MXe II/MXe Server.

6. Reach underneath the MXe carrier board and do one of the following:
   - For the MXe II, connect the IDE interconnect cable to the RTC (host) IDE connector.
   - For the MXe III, connect the I2C and SATA cables to the RTC (host) IDE connector, and then connect the I2C and SATA cables from the hard drive backplane (or RAID controller if installed).
7. Set the main board on the chassis and attach to the chassis with the captive screw.
8. Connect the cables to the main board.

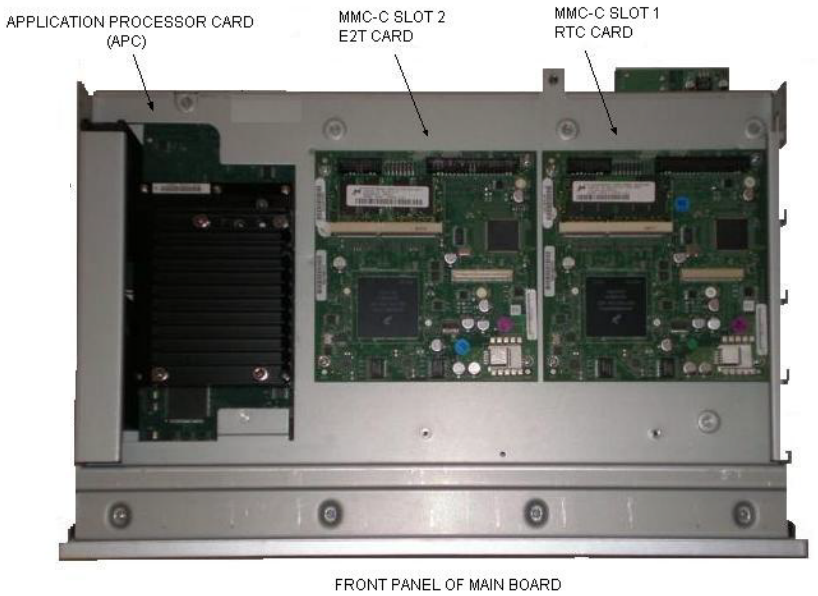


Figure 76: MXe, MXe Server: RTC / E2T/ APC on the Main Board, bottom view

Hard Drives

Hard Drive Replacement Overview

CAUTION: If you move a programmed hard drive from one controller type to another (for example, an MX system to an LX or CX system), you MUST manually install the software (see page 84) and restore the database. A new hard drive purchased from Mitel is configured for installation in any system.

CAUTION: In a redundant MXe II or MXe Server, the two PATA hard drives must have the same accessible capacity. For example, a 40 GB drive from one manufacturer may have a slightly different accessible capacity than that of a 40 GB drive from another manufacturer. To ensure that the drives match, check them carefully before installation.

CAUTION: If you install a new hard drive with Release 6.0 or later software in a system running older software, you must change the RTC file name (see page 282).
The file name for all platforms for Rel 6.0 to Rel 7.1 is: /partition1/RTC8260.
The file name for all platforms for Rel 8.0 is: /partition1/RTC8260 or /partition4/RTC8260.
Prior to Release 6.0: LX, 250/700-user: /partition1/RTC8260; MX: /partition1/Lite200UP; 100-user: /partition1/Lite8260

Tip: You are advised to perform the hard drive replacement outside of business hours.

CX/CXi

To replace the hard drive in a CX or CXi:

1. If possible, back up your database (or locate the most recent backup).
2. Unplug the ribbon cable and the power cable from the old hard drive.

Tip: Take note of the connector the ribbon cable was connected to. You will need to know this when you connect the new hard drive.

3. Remove the screws connecting the bracket to the back of the controller, then slide the bracket forward and remove it. (Removal is unnecessary if the drive is installed in the upper bracket position.)
4. Replace the drive with the new one (1) (see Figure 77 on page 206) and secure it to the bracket (2). (If the bracket was removed, re-install it and secure it to the back of the controller.) Ensure that the jumpers on the new drive are set to the Master setting.
5. Connect the power and IDE cables (ribbon cable) to the corresponding connectors on the hard drive and main board (3). The cables are keyed for proper connection.

Tip: There are two ribbon cable connectors side by side (shown in black and blue in Figure 77 on page 206). Ensure that you connect the ribbon cable to the connector **nearest** the hard drive. It is shown in blue in the figure.

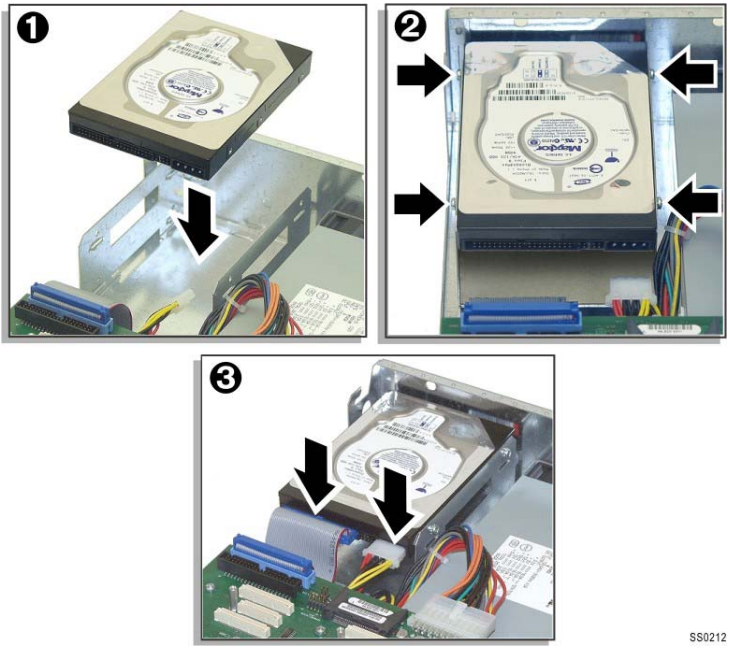


Figure 77: CX Controller Hard Drive Installation

6. Replace the controller cover.
7. Remount the controller.
8. Restore the connections to the Maintenance PC.
9. Manually install the software on the hard drive (see "Install System Software Manually" on page 84).
10. Reconnect the controller to the network.
11. If you backed up your database in Step 1, restore the database (see "Restore a Database" on page 130).

CX II/CXi II (Hard Disk or Solid State Drive)

To replace the main system hard disk drive or solid state drive in a CX II/CXi II:

1. If possible, back up your database (or locate the most recent backup).
2. Unplug the data cable and power cable from the old hard disk drive; see (1) in Figure 78.
3. Remove the two screws securing the drive to the mounting bracket, and then lift the drive out; see (2) in Figure 78.

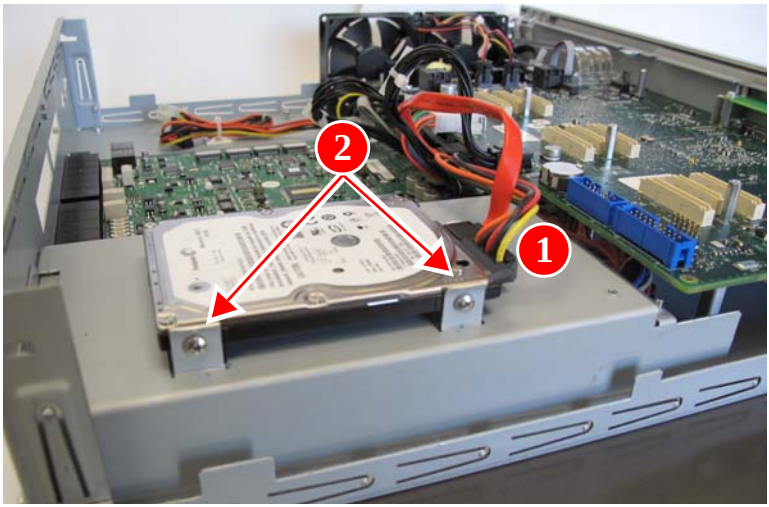


Figure 78: CX II/CXi II Hard Disk Drive/Solid State Drive Replacement

4. Replace the hard disk drive with the new one and secure it to the mounting bracket.
5. Reconnect the data cable and power cable to the hard disk drive. The cables are keyed for proper connection.
6. Replace the controller cover.
7. Remount the controller.
8. Restore the connections to the Maintenance PC.
9. Manually install the software on the hard disk drive (see “Install System Software Manually” on page 84).

10. Reconnect the controller to the network.
11. If you backed up your database in Step 1, restore the database (see "Restore a Database" on page 130).

LX

To replace the hard drive in the LX, 100, 250, or 700-user controller:

1. If possible, back up your database (or locate the most recent backup).
2. Place the controller on the work area with the bottom facing up.
3. Remove the hard drive backing plate from the controller by removing the six (6) small border screws (the four large screws secure the hard drive to the backing plate). Keep the screws.
4. Unplug the ribbon cable and the power cable from the old hard drive.
5. Connect the ribbon cable and power cable to the new hard drive.

Figure 79: LX and 700-User Controller Hard Drive Installation

6. Secure the new hard drive backing plate with the hard drive attached, to the controller cover using the screws provided.
7. Remount the controller.
8. Restore the connections to the Maintenance PC.
9. Manually install the software on the hard drive (see page 84).
10. Reconnect the controller to the network.
11. If you backed up your database in Step 1, restore the database (see page 130).

MX

To replace the hard drive in an MX controller:

1. If possible, back up your database (or locate the most recent backup).
2. Remove the four screws that secure the hard drive to the controller.
3. Remove the old hard drive (behind slot 4).
4. Unplug the ribbon cable and the power cable from the old hard drive.

Figure 80: MX Controller Hard Drive Installation

5. Connect the ribbon cable and power cable to the new hard drive.
6. Install the new hard drive (remove and discard the backing plate).
7. Secure the hard drive plate to the controller using the screws provided.
8. Replace the controller cover.
9. Remount the controller.
10. Restore the connections to the Maintenance PC.
11. Manually install the software on the hard drive (see “Install System Software Manually” on page 84).
12. Reconnect the controller to the network.
13. If you backed up your database in Step 1, restore the database (see “Restore a Database” on page 130).

MXe II (Single Hard Disk or Solid State Drive)

The MXe II ships from the factory without a storage media. Use the following procedure to install or replace one of the following:

- 80 GB PATA hard drive
- 32 GB PATA solid state drive (SSD)

The flash drive includes MCD software and installs exactly the same way as a single hard drive

Note: To install two hard drives for RAID functionality, see "MXe II/MXe Server (Two Hard Drives)" on page 210. RAID is not available for solid state drives.

To replace the single hard drive or SSD in an MXe II controller:

1. For first-time installation skip to Step 2. To replace the drive,
   - If possible, back up your database (or locate the most recent backup).
   - loosen the captive screw and slide the defective hard (HD1) drive from the drive carrier.
   - remove the four screws that secure the drive to the carrier.
2. Slide the (replacement) hard drive or SSD into the drive carrier and secure with the four screws. For first-time installation, use the screws supplied with the drive.
3. Push to seat the hard drive or SSD into the backplane.
4. Tighten the captive screw.
5. Manually install the software on the hard drive or SSD (see "Install System Software Manually" on page 84).
6. Reconnect the controller to the network.
7. If you backed up your database in Step 1, restore the database (see "Restore a Database" on page 130).

MXe II/MXe Server (Two Hard Drives)

The MX II and MXe Server can be equipped with two hard drives in a RAID (Redundant Array of Independent Disks) configuration.

If both drives are defective, or if the system is still under warranty, replace both drives.

Note: Before proceeding with a warranty claim, contact Mitel Repair Services (page 9) to obtain a Return of Merchandise Authorization (RMA) number.

If only one drive is defective and the system is no longer under warranty, use the following procedure to determine whether you should replace one or both drives.

To determine whether to replace one or both hard drives, do the following:

1. Obtain the 2-pack hard disk drive kit (Part Number 50005686).

Note: You must obtain the 2-pack kit, even if you intend to replace only one hard drive in the controller.

2. Open the controller and compare the defective hard drive to the replacement hard drives. Use Table 121 on page 394 to verify the hard drive sizes and part numbers. Depending on whether the old and new hard drives match, do the following:
   - If the hard drives are the same size, replace only the defective drive. The drives can be from different manufacturers, but their accessible capacity must match. Use the following procedure: "Replace One Hard Drive in an MXe II/MXe Server" on page 211.
   - If the hard drives are different sizes, replace both drives. Use "Replace Both Hard Drives in an MXe II" on page 212 or "Replace Both Hard Drives in an MXe Server" on page 213.

Replace One Hard Drive in an MXe II/MXe Server

Replace one hard drive in a RAID configuration if only one drive is defective, the system is no longer under warranty, and the current and replacement drives are the same size.

To replace one hard drive in an MXe II/MXe Server:

Tip: Refer to Table 77 on page 343 for a complete description of LED activity.

1. If the hard drive is already off-line (normally or faulted) go to step 5.
2. Take the hard drive off-line by using a small pointed object (paper clip).
   - Press the mirror control (ctrl) button, for less than five seconds, of the hard drive to be removed.
   - Release the button when the **Access LED starts flashing once per second**.

3. Hard drive is off-line when the Access LED is off and the fault LED is orange.
4. Release the retaining screw securing the hard drive carrier to the controller.
5. Slide the defective hard drive out of the hard drive carrier.
6. Remove the four screws securing the hard drive to the hard drive carrier.
7. Install the new hard drive in the hard drive carrier with the four screws.
8. Slide the hard drive into the controller.
9. Push to seat the hard drive into the hard drive backplane.
10. Tighten the thumb screw.
11. To copy data onto the new drive, press and hold down the Mirror Cntrl button of the new hard drive for **between 6 and 10 seconds** and then release. Release the button when the Access LED starts flashing twice per second.

CAUTION: If you hold the Mirror Cntrl button down longer than 10 seconds, the hard drives may become corrupt. If you accidentally hold down the button beyond the 10 seconds, continue to hold down the button until the access LED turns on.

12. The rebuild process is indicated by the Access LED solid green and the Fault LED flashing green.
13. The rebuild is complete when the Fault LED is off (approximately 20G per hour).

Replace Both Hard Drives in an MXe II

Use this procedure if:

- both drives are defective, or
- the system is still under warranty, or
- the current and replacement drives are different sizes.

CAUTION: You must install only the first hard drive before you boot the system. After the system is fully booted, slide the second hard drive into the HD2 position.

To replace both hard drives in an MXe II:

1. Ensure that you have a database backup, if possible.
2. Loosen the captive screws and slide the hard drives from the hard drive carrier.
3. Clear the sockets (refer to Knowledge Base Article 06-2806-00012).
4. Replace the old hard drive with the new hard drive in the hard drive carrier and secure with the four screws.
5. Slide the first hard drive into the HD1 position. DO NOT INSTALL the second hard drive at this time.
6. Push to seat the first hard drive into the hard drive backplane.
7. Tighten the thumb screw.
8. Return power to the controller, but do not connect to the network. The HD1 access LED should be green, HD2 fault LED should be orange, and the activity LED should flash orange and green
9. Once the system is booted, the activity LED will be green most of the time. Manually install the software on the hard drive (see “Install System Software Manually” on page 84).
10. Reconnect the controller to the network.
11. Replace the second old hard drive with the second new hard drive in the hard drive carrier and secure with the four screws.
12. Slide the second hard drive into the HD2 position.
13. Push to seat the hard drive into the hard drive backplane.
14. Tighten the thumb screw.
15. To copy data onto the second new hard drive, complete steps 11 to 13 of the “Replace One Hard Drive in an MXe II/MXe Server” procedure on page 211.

Replace Both Hard Drives in an MXe Server

Use this procedure if:

- both drives are defective, or
- the system is still under warranty, or
- the current and replacement drives are different sizes.

CAUTION: You must install only the first hard drive before you boot the system. After the system is fully booted, slide the second hard drive into the HD2 position.

To replace both hard drives in an MXe Server:

1. Ensure that you have a database backup (if possible).
2. Loosen the captive screws and slide the hard drives from the hard drive carrier.
3. Clear the sockets (refer to Knowledge Base Article 06-2806-00012).
4. Replace the old hard drive with the new hard drive in the hard drive carrier and secure with the four screws.
5. Slide the first hard drive into the HD1 position. DO NOT INSTALL the second hard drive at this time.
6. Push to seat the first hard drive into the hard drive backplane.
7. Tighten the thumb screw.
8. Return power to the controller.
9. Once the system is booted, install and configure Mitel Standard Linux (MSL) software on the hard drive (see "Installing MSL Software on an MXe Server" on page 105).
10. Reconnect the controller to the network.
11. Replace the second old hard drive with the second new hard drive in the hard drive carrier and secure with the four screws.
12. Slide the second hard drive into the HD2 position.
13. Push to seat the hard drive into the hard drive backplane.
14. Tighten the thumb screw.
15. To copy data onto the second new hard drive, complete steps 11 to 13 of the "Replace One Hard Drive in an MXe II/MXe Server" procedure on page 211.
16. To reinstall and/or relicense the software, follow the steps in "Recover MXe Server" on page 143.

MXe III (Single Hard Disk or Solid State Drive)

The MXe III ships from the factory without a storage media. Use the following procedure to install or replace one of the following:

- 160 GB SATA hard drive
- 32 GB SATA solid state drive (SSD)

The flash drive includes MCD software and installs exactly the same way as a single hard drive

Note: To install two hard drives for RAID functionality, see “MXe III (Two Hard Drives)” on page 216. RAID is not available for solid state drives.

To replace the single hard drive or SSD in an MXe III controller:

1. For first-time installation skip to Step 2. To replace the drive,
   - If possible, back up your database (or locate the most recent backup).
   - loosen the captive screw and slide the defective hard (HD1) drive from the drive carrier.
   - remove the four screws that secure the drive to the carrier.
   - Slide the (replacement) hard drive or SSD into the drive carrier and secure with the four screws. Ensure the hard drive is oriented as illustrated in Figure 81.

Figure 81: Hard Drive / SSD Installed in Drive Carrier

2. Push to seat the hard drive or SSD into the backplane.
3. Tighten the captive screw.
4. Manually install the software on the hard drive or SSD (see “Install System Software Manually” on page 84).
5. Reconnect the controller to the network.
6. If you backed up your database in Step 1, restore the database (see “Restore a Database” on page 130).

MXe III (Two Hard Drives)

If the MXe III has two hard drives in a RAID (Redundant Array of Independent Disks) configuration, you can replace one or both of them.

Note: If the system is under warranty, you must replace both hard drives. Before proceeding with a warranty claim, contact Mitel Repair Services (page 9) to obtain a Return of Merchandise Authorization (RMA) number.

- "Replace One Hard Drive in an MXe III" on page 216
- "Replace Both Hard Drives in an MXe III" on page 217

Replace One Hard Drive in an MXe III

Replace one hard drive in a RAID configuration if only one hard drive is defective and the system is no longer under warranty.

To replace one hard drive in an MXe III:

Note: The defective hard drive is indicated by a flashing green Host LED.

Tip: Refer to Table 79 on page 345 for a complete description of LED activity.

1. Release the retaining screw securing the hard drive carrier to the controller.
2. Slide the defective hard drive out of the hard drive carrier.
3. Remove the four screws securing the hard drive to the hard drive carrier.
4. Install the new hard drive in the hard drive carrier with the four screws. Make sure it is correctly oriented (right side up); see Figure 81.
5. Slide the hard drive carrier into the controller.
6. Push to seat the hard drive carrier into the hard drive backplane.
7. Tighten the thumb screw.
8. The rebuild process starts automatically. Mirroring is indicated by the HD LEDs. The source drive LED flashes quickly (indicating that the disk is being accessed) while the destination drive flashes slowly. The rebuild is complete when the destination drive LED no longer flashes slowly (approximately 80G per hour).

Replace Both Hard Drives in an MXe III

Replace both hard drives if they are both defective, or if the system is still under warranty.

Note: Contact Mitel Repair Services before proceeding with warranty work.

CAUTION: You must install only the first hard drive before you boot the system. After the system is fully booted, slide the second hard drive into the HD2 position.

To replace both hard drives in an MXe III:

1. Ensure that you have a database backup, if possible.
2. Loosen the captive screws and slide the hard drives from the hard drive carrier.
3. Clear the sockets (refer to Knowledge Base Article 06-2806-00012 for steps that are unqiue to MXe III).
4. Replace the old hard drive with the new hard drive in the hard drive carrier and secure with the four screws. Make sure it is correctly oriented (right side up); see Figure 81.
5. Slide the first hard drive into the HD1 position. DO NOT INSTALL the second hard drive at this time.
6. Push to seat the first hard drive into the hard drive backplane.
7. Tighten the thumb screw.
8. Manually install the software on the hard drive (see “Install System Software Manually” on page 84).
9. Replace the second old hard drive with the second new hard drive in the hard drive carrier and secure with the four screws.
10. Slide the second hard drive into the HD2 position.
11. Push to seat the hard drive into the hard drive backplane.
12. Tighten the thumb screw.
13. Install the controller cover and power up the controller; see page 14.

14. The rebuild process starts automatically. The source drive LED (HD1) flashes quickly while the destination drive LED (HD2) flashes slowly. The rebuild is complete when the HD2 LED no longer flashes slowly (approximately 80G per hour).
15. Reconnect the controller to the network.

Fan Complex

MXe/MXe Server

To replace the fan in an MXe or MXe Server:

1. Remove the controller cover (see page 47).
2. Remove the two screws that fasten the fan to the cabinet frame (see Figure 82).

Note: The fan depicted in Figure 82 is the early version. The new version uses longer cables that must be tied off as shown in Figure 83.

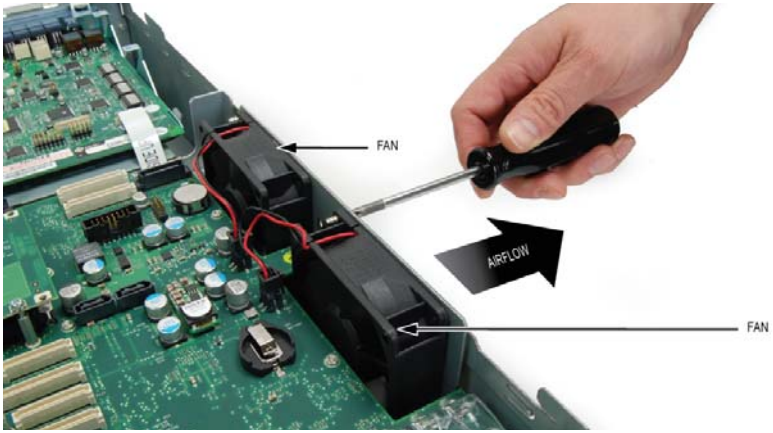


Figure 82: Fan Removal

3. Remove the fan power connector from the MXe chassis board and remove the faulty fan.
4. Insert the replacement fan so that
   - the power cables exit the fan closest to the fan power connector, and
   - the sticker label on the center of the fan is facing out from the cabinet towards the grill.

   For proper air flow, the fan sticker label must be facing the cabinet grill.

5. If you have a new fan assembly with longer cables, loop and tie them together using the supplied cable ties as shown in Figure 83.

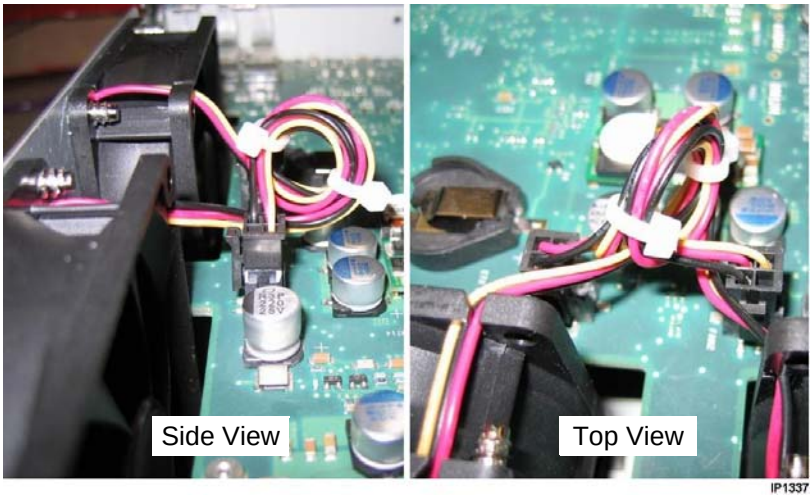


Figure 83: Fan Cable Management (New Fan Assembly)

6. Replace the fan screws.
7. Plug in the fan power connector.
8. Replace the cabinet cover and secure with screw.

AX

To replace the fan in an AX controller:

1. Loosen the captive screws; one at each end of the fan assembly.
2. Pull out the fan unit carefully. The cable is attached to the back of the fan unit at the right side.
3. Disconnect the cable by squeezing the latch at the cable end of the connector and carefully wiggling the connector out.
4. Connect the new fan unit cable and set the new fan assembly in place.
5. Tighten the two fan assembly screws.

CX II/CXi II

To replace the fan assembly in an CX II/CXi II:

1. Power down the controller and remove the controller cover; see page 47 of the Technician's Handbook for procedure.
2. Using diagonal cutters, clip the tie-wrap around the fan and ethernet cables; see (1) in Figure 82. Take care to avoid cutting the cables.
3. Disconnect the two fan power cables from the main board; see (2) in Figure 82.
4. Remove the four screws that fasten the fan assembly to the cabinet frame; see (3) in Figure 82.

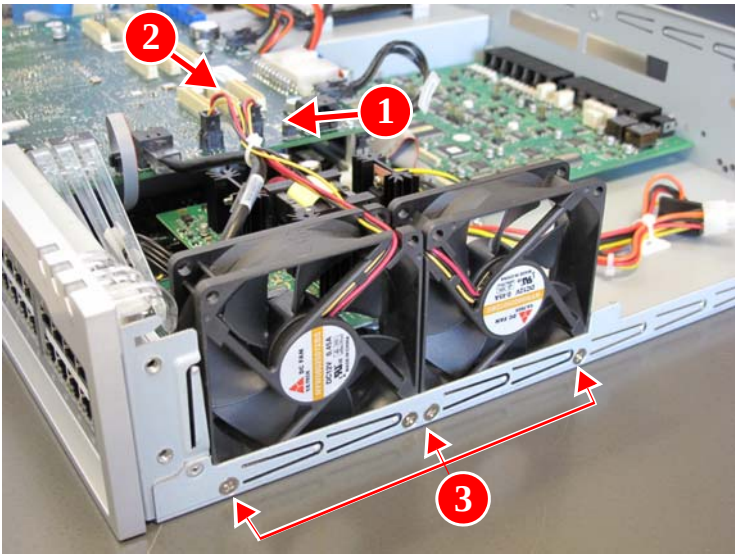


Figure 84: Fan Removal

5. Remove the fan assembly from the controller chassis.
6. Insert the replacement fan assembly so that the sticker label on the center of the fans are facing out from the cabinet towards the grill. For proper air flow, the fan sticker label must be facing the cabinet grill.
7. Replace the fan screws.
8. Connect the two fan power cables.
9. Replace the cabinet cover and secure with screw.

Power Supply Unit

MXe, AX

To replace a power supply unit in a single power supply MXe or AX:

1. Turn off the power switch on power supply.
2. Remove the power cord from the power supply AC receptacle.
3. Loosen the thumb screw with a Phillips screwdriver on the power supply and slide it out.
4. Remove the defective power supply unit from the rear of the controller.
5. Slide the new power supply unit into the controller.
6. Push to seat the power supply into the system power connector.
7. Secure the thumb screw and tighten it with a Phillips screwdriver.
8. Connect the power cord and set the AC power switch to ON.

ASU II

To replace the ASU II AC power supply:

1. Remove the power cord from the power supply AC receptacle.
2. Loosen the thumb screw on the power supply using a Phillips screwdriver.
3. Pull the power supply out.
4. Slide the new power supply into the slot on the rear of the ASU II, with the thumb screw on the bottom.
5. Push to seat the new power supply into the system.
6. Secure the thumb screw and tighten it with a Phillips screwdriver.
7. Insert the AC power cord into the power supply AC receptacle.

Redundant Power Supply

AX, MXe, MXe Server

To add or replace a redundant power supply in an AX, MXe or MXe Server:

Tip: If two power supplies are installed, one can be swapped out without turning the other off. The system can remain running on one power supply while the other is replaced.

1. Set the AC power switch to OFF, and remove the power cord from the AC receptacle on the power supply.
2. Loosen the thumb screw on the power supply with a Phillips screwdriver.
3. If replacing a power supply, slide the power supply unit out of the power supply carrier on the rear of the controller
   or
   If adding a power supply, remove the power supply unit blanking panel.
4. Slide the new power supply unit into the power supply carrier on the rear of the controller.
5. Push to seat the power supply into the power supply backplane.
6. Secure the thumb screw with a Phillips screwdriver and connect the power cord.
7. Set the AC power switch to ON. AC and DC LEDs will illuminate.

RAID Controllers

The RAID (Redundant Array of Independent Disks) controller mirrors all data on two hard drives. In the event that one drive fails, the system continues to operate on the remaining drive. Refer to Knowledge Base Article 06-2806-00012 "RAID Controller Operations Manual" for RAID operation details.

CAUTION: The RAID controller does not protect against loss of data as a result of a power outage. You must provide an Interruptible Power Supply (UPS) to protect your system data from an electrical disturbance.

Tip: It is very important to maintain current database backups; backups should be done on a regular basis even when you have disk redundancy.

MXe II/MXe Server

To add a RAID controller in an MXe II or MXe Server:

1. Access the MXe carrier board (see page 159).
2. Remove the IDE interconnect cable from the interconnect card (see Figure 38 on page 161).
3. Using a Phillips #2 screwdriver, remove the three retaining screws from the interconnect card. Remove the interconnect card and place it in an anti-static bag.
4. Before you install the RAID controller, first remove the grey plastic bezel that covers the RAID controller LED and push button holes. The bezel is located on the rear panel of the controller cover.
5. On the inside of the cover, insert a thin, pointed object through an LED hole. Push the bezel cover out far enough to allow you to grasp the top and bottom edges. Pull the bezel cover off the controller cover.
6. Position the new RAID controller board by carefully inserting the LED indicators into the holes in the controller rear panel (see Figure 85).

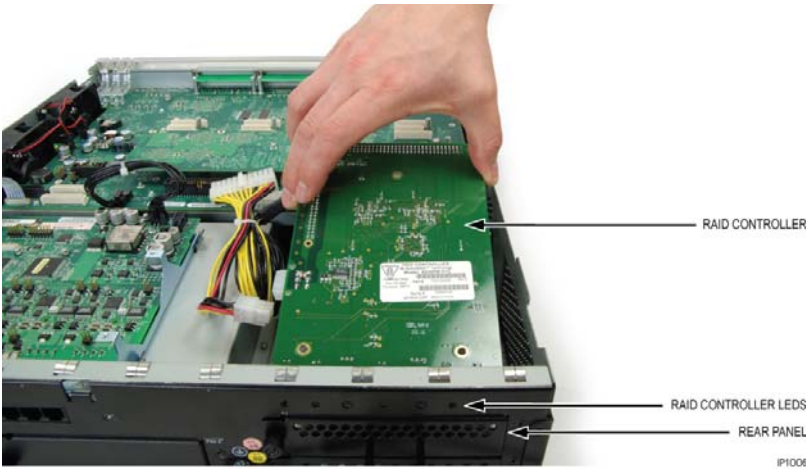


Figure 85: Position the RAID Controller Board

7. Slowly retract the RAID controller from the LED module holes until its high-density HDD connector is aligned over the backplane connector.
8. Press the high-density HDD backplane connector gently into place on the backplane connector.
9. Secure the RAID controller to the standoffs with the three (3) screws.
10. Take the pre-formed IDE interconnect cable that was shipped with the 2-pack hard drives and connect the host connector (blue) to the RTC (host) IDE connector on the underside of the MXe carrier board (MXe II), or to the IDE connector on the mid-plane (MXe Server). Note that the connector is keyed.
11. Route the pre-formed IDE cable through the channel in the cabinet chassis and connect the other end to the keyed HDD interface connector on the RAID controller.

CAUTION: Ensure that you route the IDE interconnect cable through the channel in the cabinet chassis (see Figure 86).

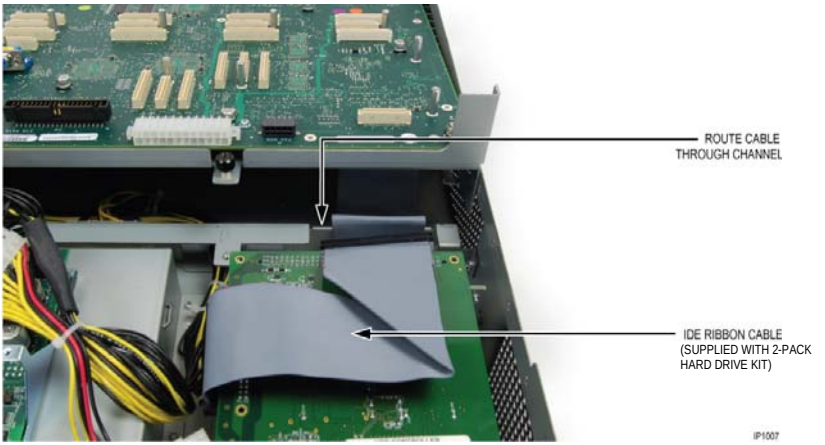


Figure 86: Routing the Pre-formed IDE Interconnect Cable

12. Carefully lower the MXe carrier chassis back into place. Ensure that the ribbon cable is in the channel and does not become pinched between the cabinet frame and the MXe carrier chassis.
13. Slide the MXe carrier chassis back into position. Ensure that the metalwork beneath the faceplate engages the cabinet chassis. Tighten the chassis retaining screw (see Figure 37 for the location of the chassis retaining screw).
14. Reconnect the power cables to the connectors on the MXe carrier chassis. Then, connect power connector to RAID controller.
15. Reinstall the Stratum 3 clock module with the retained screws (MXe II only).
16. If an AMB is present, reconnect the power and ribbon cables between the AMB and the MXe carrier board.

CAUTION: DO NOT install second hard drive.The hard drives in a redundant hard drive system must have the same size (accessible capacity).

17. Replace the top cover and secure with screw.
18. Power on controller and proceed with step 7 of section "Replace One Hard Drive in an MXe II/MXe Server" on page 211.

To replace a faulty RAID controller

1. Remove the controller cover (see page 47).
2. Disconnect the IDE interconnect cable and power cable from the faulty RAID controller.
3. Using a Phillips #2 screwdriver, remove the three screws from the RAID controller.
4. Remove the faulty RAID controller and place it in an anti-static bag.
5. Remove the replacement RAID controller from the anti-static bag.
6. Position the replacement RAID controller by carefully inserting the LED indicators into the holes in the controller rear panel (see Figure 85).
7. Slowly retract the RAID controller from the LED module holes until its high-density HDD connector is aligned over the backplane connector.
8. Press the high-density HDD backplane connector gently into place on the backplane connector.
9. Secure the replacement RAID controller to the standoffs with the three (3) screws.
10. Reconnect the power cables between the MXe carrier board and the RAID controller.
11. Connect the IDE interconnect cable to the HDD interface on the RAID controller.
12. Replace the top cover. Using a #1 Phillips screwdriver, tighten the screw that fastens the top cover to the chassis.

MXe III

To add a RAID controller in an MXe III:

1. Access the MXe III carrier board (see page 159).
2. Before you install the RAID controller, first remove the grey plastic bezel that covers the RAID controller LED and push button holes. The bezel is located on the rear panel of the controller.
3. On the inside of the cover, insert a thin, pointed object through an LED hole. Push the bezel cover out far enough to allow you to grasp the top and bottom edges. Pull the bezel cover off the controller cover.

4. Position the new RAID controller board by carefully inserting the LED indicators into the holes in the controller rear panel (see Figure 87).

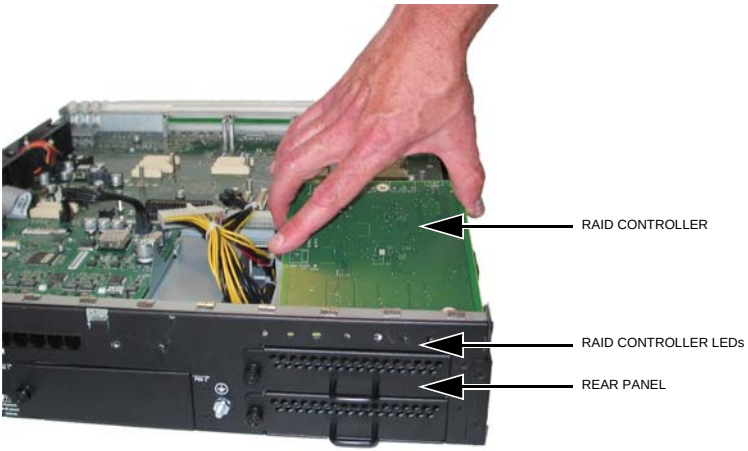


Figure 87: Position the SATA RAID Controller Board

5. Slowly retract the RAID controller from the LED holes until the mounting holes align with the standoffs.

6. Secure the RAID controller to the standoffs with the three (3) screws.

7. Cut the cable tie joining the I2C (small ribbon) cable to the SATA cable.

8. Connect the I2C (small ribbon) cable to the P5 RAID I2C connector on the RAID controller.

9. Disconnect the SATA cable from the HD1 connector on the HD backplane and reconnect it to the Host P1 connector on the RAID controller.

10. Using one of the supplied SATA cables, connect the HD1 connector on the HD backplane to the HD1 P3 connector on the RAID controller.

11. Using the second SATA cable, connect the HD2 connector on the HD backplane to the HD2 P2 connector on the RAID controller.

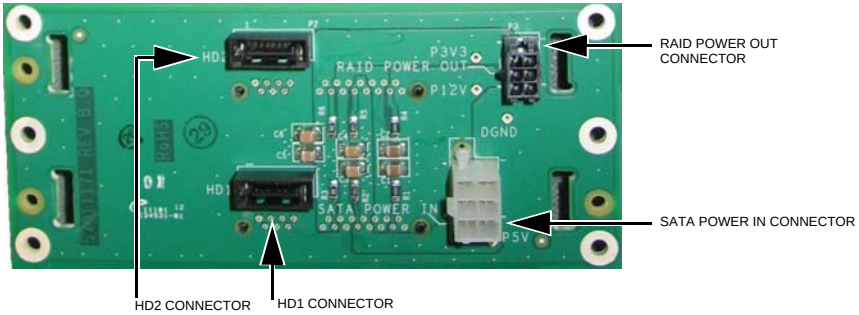


Figure 88: Hard Drive Backplane Connectors

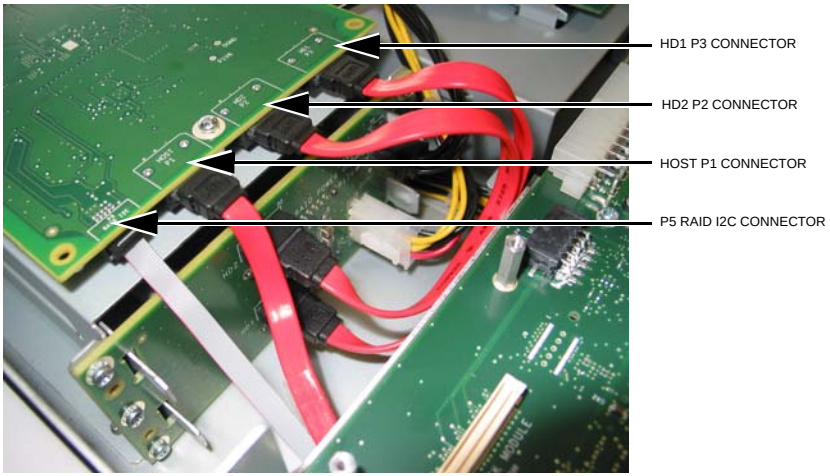


Figure 89: RAID Controller Connectors

12. Using the supplied power cable, connect the RAID POWER OUT connector on the HD backplane to the SATA BCKPLNE POWER connector on the RAID controller.

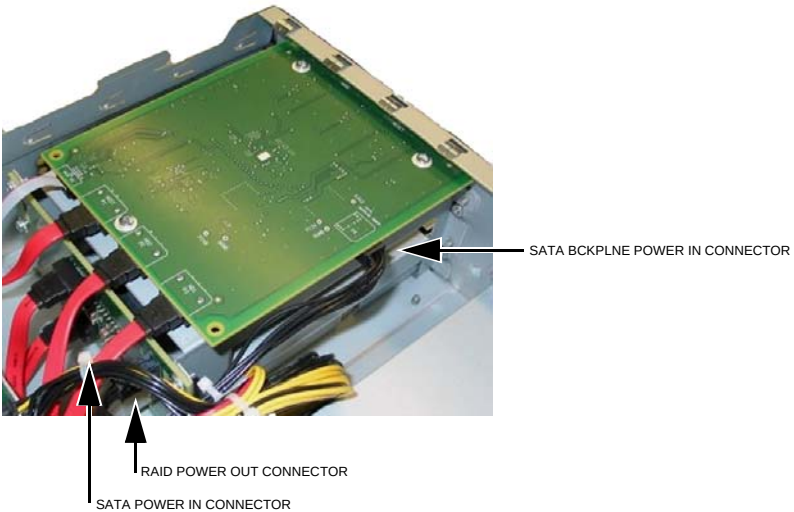


Figure 90: Power Connectors

Note: Push the SATA, I2C and power cables out of the way so that they are not pinched by the top cover.

13. Reinstall the Stratum 3 clock module with the retained screws.

CAUTION: DO NOT install second hard drive.

14. Replace the top cover and secure with screw.

15. Power on controller and proceed with step 7 of section "Replace One Hard Drive in an MXe III" on page 216.

To replace a faulty RAID controller

1. Remove the controller cover (see page 47).

2. Disconnect the three SATA cables, the I2C cable, and the power cable from the faulty RAID controller.

3. Using a Phillips #2 screwdriver, remove the three screws from the RAID controller.

4. Remove the faulty RAID controller and place it in an anti-static bag.

5. Remove the replacement RAID controller from the anti-static bag.

6. Position the replacement RAID controller by carefully inserting the LED indicators into the holes in the controller rear panel (see Figure 85).
7. Slowly retract the RAID controller from the LED holes until the mounting holes align with the standoffs.
8. Secure the replacement RAID controller to the standoffs with the three (3) screws.
9. Reconnect the power cable to the RAID controller.
10. Carefully reconnect the three SATA cables:
    - Connect the RTC (under chassis) to the Host P1 connector on the RAID controller.
    - Connect the HD1 connector on the HD backplane to the HD1 P3 connector on the RAID controller.
    - Connect the HD2 connector on the HD backplane to the HD2 P2 connector on the RAID controller.
11. Connect the I2C (small ribbon) cable to the P5 RAID I2C connector on the RAID controller.
12. Replace the top cover. Using a #1 Phillips screwdriver, tighten the screw that fastens the top cover to the chassis.

Line Cards

AX

To install 24 Port ONS, 16 Port ONS, or 4+12 Port Combo line cards:

1. If necessary, loosen the thumb screw and remove the blanking plate from the cabinet rear.
2. Slide the card into the slot, with the lock latch open, and seat it securely.
3. Close the lock latch and tighten the thumb screw with a Phillips screwdriver.
4. Connect the Amphenol cable and secure the strap.

ASU II

The ASU II can be configured with one or two line cards. You can install one or two 16 port ONS cards, one or two 4 + 12 port combo cards (4 LS trunks and 12 ONS lines), or one of each.

Note: You must buy a license for each ASU II you install.

To install 24 Port ONS, 16 Port ONS, or 4+12 Port Combo line cards:

1. If necessary, loosen the thumbscrew using a Phillips screwdriver and remove the blanking plate from the cabinet rear.
2. Slide the card into the slot, with the lock latch open, and seat it securely.
3. Close the lock latch and tighten the thumbscrew with a Phillips screwdriver.
4. Connect the Amphenol cable and secure the strap.

Controller Card (AX)

To replace the AX controller card:

1. Power down the controller and disconnect cables.
2. From the rear of the controller, loosen the lock screws.
3. Lift the lock latch and slide the controller card from the chassis.
4. Transfer the i-Button, flash card(s), and MMCs to the new controller card.
5. Slide the replacement controller card into the chassis.
6. Push the lock latch down and tighten the lock screws.
7. Connect the cables and power up the controller.

Flash Cards (AX)

There are two flash cards for the AX controller:

- System flash (labeled Compact Flash 2): under the MMC Slot 1 site
- Voice mail flash (labeled Compact Flash 1): under the MMC Slot 2 site

Note: Voice Mail is optional on the AX Controller. As shipped, Flash 1 is used only for system files. See "To upgrade Flash 1 to add voice mail capability:" on page 235.

To add or replace a flash card in the AX:

1. Power down the controller.
2. Turn off the power switches on the power supplies and unplug the power cords.
3. Remove the controller card (page 233).
4. Remove the MMC from site 1 or site 2, as necessary.

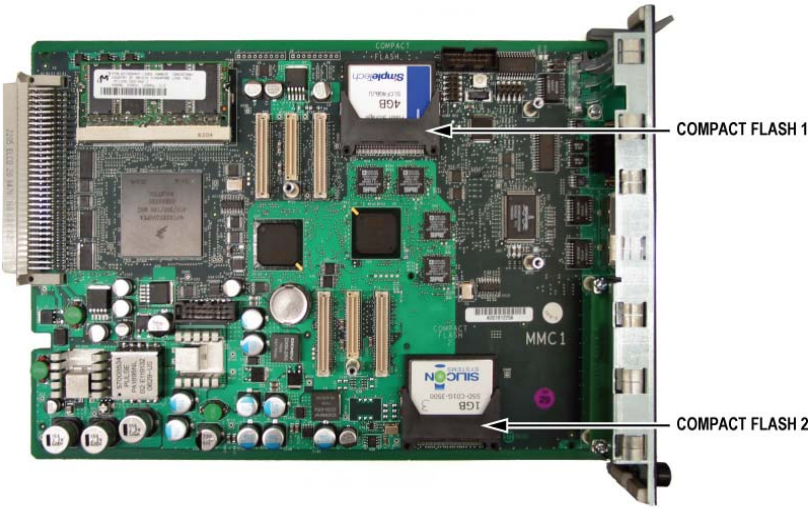


Figure 91: AX Flash 1 and Flash 2 Locations

Tip: MMC 2 does not have to be removed for Flash 1 to be removed or installed.

5. Slide out the defective flash, and insert the replacement flash in the correct position.

6. Replace the controller card and connect the cables.
7. Plug in and turn on the power supplies and power up the controller.
8. Perform a full install of the system software from the Software Installer tool.

To upgrade Flash 1 to add voice mail capability:

1. Power down the controller.
2. Turn off both power switches on the power supplies.
3. Remove the controller card (page 233).
4. Slide out Flash 1, and slide the 4 GByte Voice Mail Flash into the Flash 1 position.
5. Replace the controller card and connect the cables.
6. Plug in and turn on the power supplies and power up the controller.
7. Perform a full install of the system software from the MCD Software Installer tool.

Note: A full install formats the 4 GByte flash and creates the voice mail partitions. It is required if the system software was initially installed with a 512MB Flash 1 card present.

Memory Module (CX, CXi, AX)

Follow this procedure to upgrade the factory-installed 256M RAM to 512M:

1. Power down the controller and disconnect all cables.
2. Remove the controller cover (page 47). For the AX controller, remove the controller card (page 233).
3. Locate the memory module.

Figure 92: Memory Module

4. Remove the installed memory module as follows:
   - pull both spring retainer clips on either side of the module outward (see Figure 93).
   - grasp the module by the sides, and carefully pull it out of its connector. Place it in an antistatic bag.

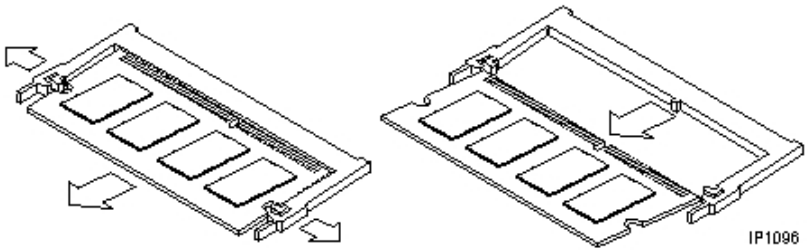


Figure 93: Memory Module Removal

5. Install the replacement memory module as follows:
   - remove the module from its protective packaging, holding the module only by the edges.
   - holding the module at approximately a 30-degree angle to the board, insert the bottom edge of the module into the slot's connector (see Figure 94).
     The socket and module are both keyed, which means the module can be installed one way only.

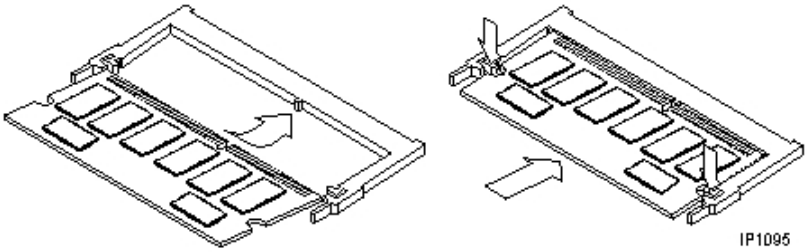


Figure 94: Memory Module Installation

6. With even pressure, push simultaneously on both upper corners of the module until its bottom edge is firmly seated in the connector.
7. Press the top edge of the module toward the board until the retainer clips click into place.
8. Affix the label included with the replacement module to the main board. The label ensures proper handling should you need to return the controller to Mitel for repair.
9. Replace the cover and reconnect power.
10. Verify that the module and software is properly installed by powering up the controller and confirming that it boots up.

Install Cabinet FRUs

Refer to the Release 7.0 version of the Technician's Handbook for peripheral cabinet, digital service unit, and SUPERSET HUB FRU procedures.

Appendix A

Hardware Reference

System Configurations

There are several basic versions of the 3300 ICP:

- MXe Server
- AX Controller
- MXe Controller
- CXi and CXi II system with embedded Analog and an Ethernet Layer 2 switch
- CX and CX II system with embedded Analog and without Ethernet Layer 2 switch

Controller Hardware Details

For detailed information on the 3300 ICP components, see the *3300 ICP Hardware Technical Reference Manual* on Edocs (http://edocs.mitel.com).

Tip: Refer to the Release 7.0 version of the Technician's Handbook for hardware details of the older controllers; 100-user, 250/700-user, LX, and MX, and their components.

Controller Components

Tip: For each module, the leftmost connectors correspond to Port 1 for that module, and the rightmost to Port 2.

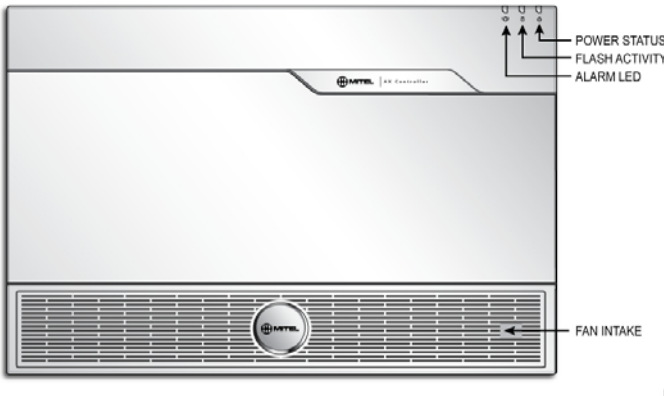


Figure 95: AX Controller – Front Panel

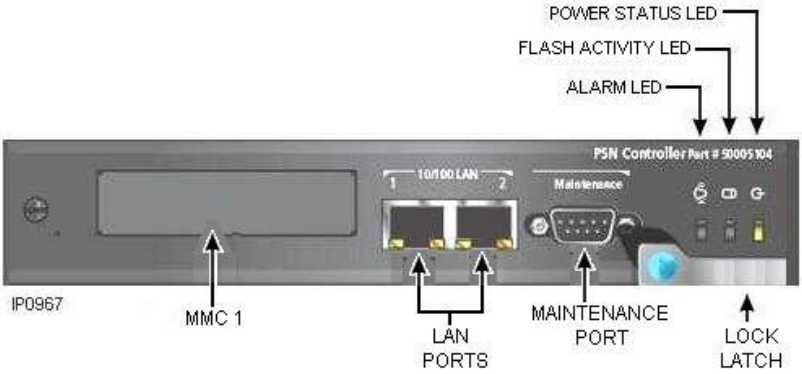


Figure 96: AX Controller Card View

Figure 97: AX Controller – Rear Panel

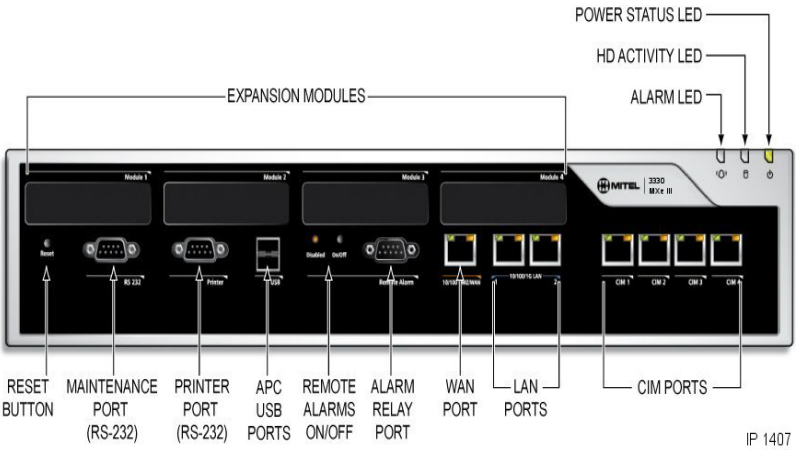


Figure 98: MXe Controller – Front Panel

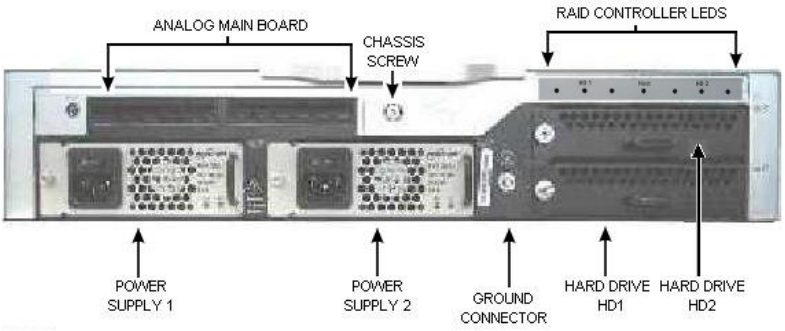


Figure 99: MXe Controller – Back Panel, Redundant

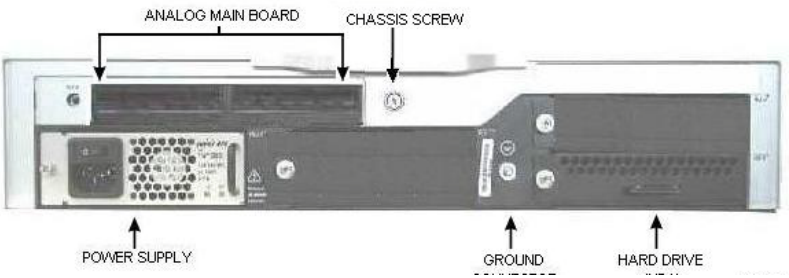


Figure 100: MXe Controller – Back Panel, Non-Redundant

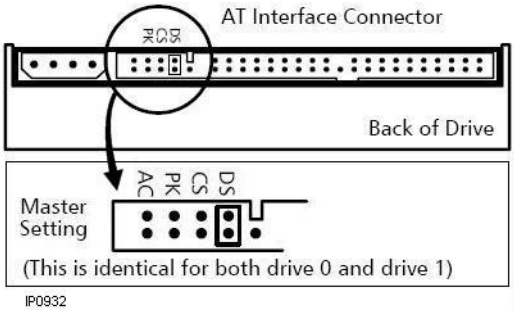


Figure 101: MXe II Controller – Hard Drive Jumper Settings

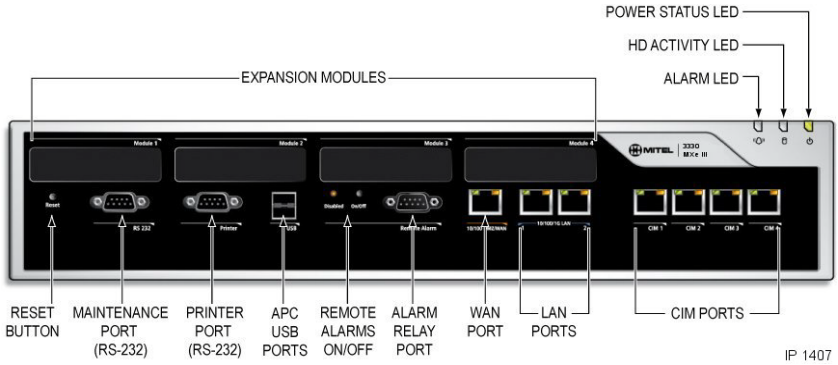


Figure 102: MXe Server – Front panel – CIM ports not used

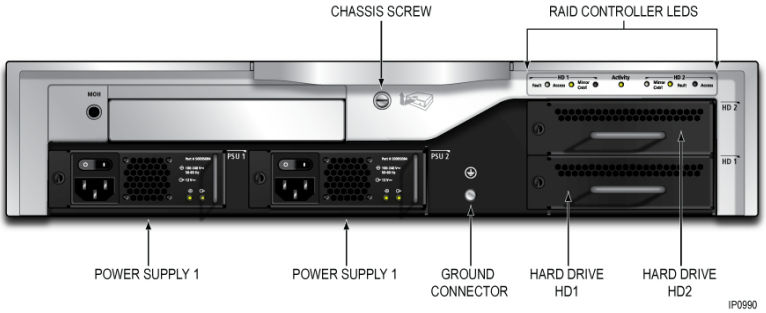


Figure 103: MXe Server – Back panel

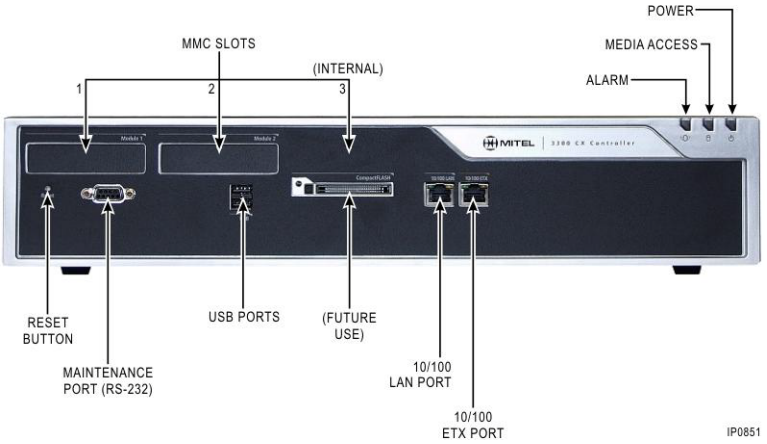


Figure 104: CX Controller – Front Panel

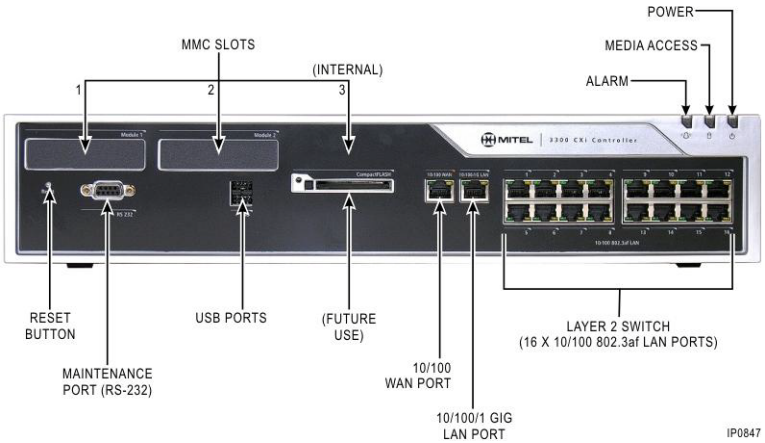


Figure 105: CXi Controller – Front Panel

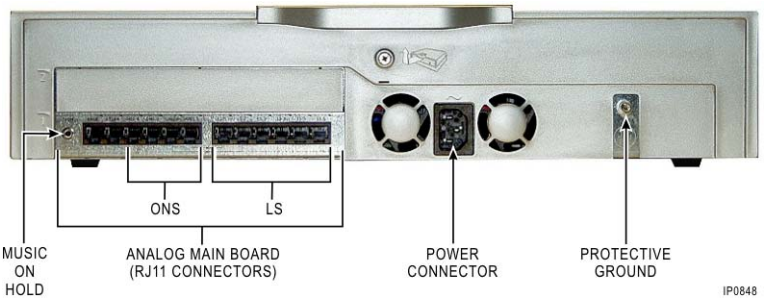


Figure 106: CX and CXi Controller – Back Panel

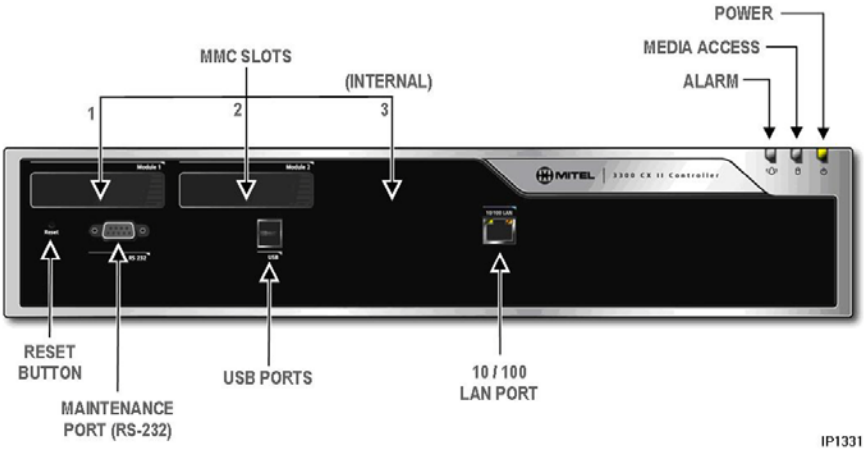


Figure 107: CX II Controller - Front Panel

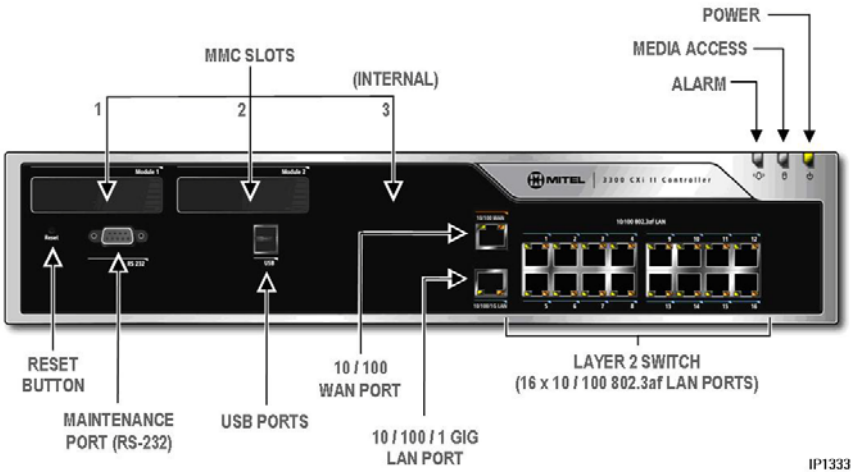


Figure 108: CXi II Controller - Front Panel

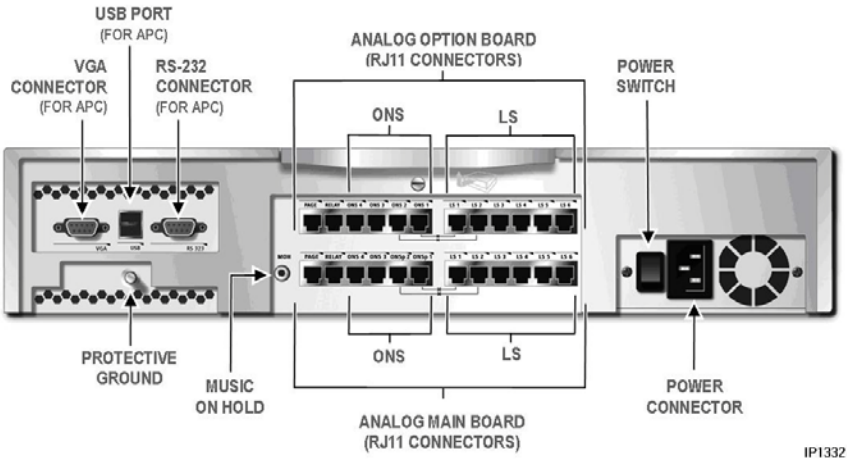


Figure 109: CX II and CXi II - Back Panel

Controller Cabinet Numbering

- Cabinet 1 (hardcoded): internal.
- Cabinets 2 to 13: module ports (left to right)

Note: LX and MXe have 4 embedded CIM ports. MX has 2 embedded CIM ports. All systems except for LX and MXe Server have Embedded Analog.

T1/E1 Combo Card

The T1/E1 combo module provides T1 trunking and DSP functionality for the CX with Release 6.0 software and for all controllers (266/300 MHz minimum) with Release 7.0 software (MCD 4.0 on the CX II/CXi II). The DSP provides resources for CLASS tone generation, Record a Call conferences, DMTF receivers, voice compression. The card also provides voice echo cancellation.

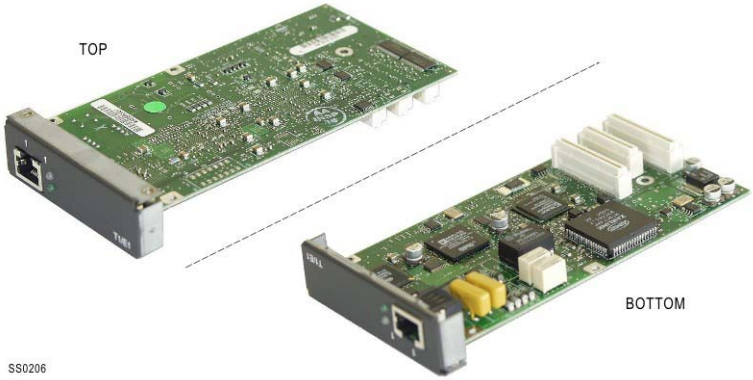


Figure 110: T1/E1 Combo Card (prior to Release 7.0)

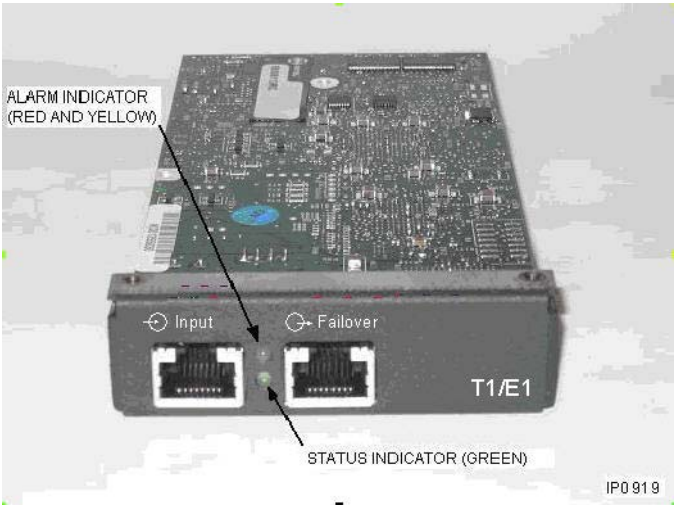


Figure 111: T1/E1 Combo Card - Resilient, from Release 7.0

Table 24: T1/E1 Combo Card Tip/Ring Assignments

Pin	Signal	NT/LT Settings	
		NT (Default)	LT
1	--	Rx Ring	Tx Ring
2	--	Rx Tip	Tx Tip
3	N/C	--	--
4	--	Tx Ring	Rx Ring
5	--	Tx Tip	Rx Tip
6	N/C	--	--
7	N/C	--	--
8	N/C	--	--
Note: Network and Line Termination settings are software-controlled. DO NOT move the jumpers. The settings apply to both connectors on the resilient card.			

Dual T1/E1 Framer

Figure 112 below shows the dual T1/E1 module, which provides embedded PRI and embedded T1/D4 functionality to a minimum 300 MHz controller.

Figure 112: Dual T1/E1 Framer

Quad BRI Framer

Figure 113 below shows the Quad BRI module which provides embedded BRI functionality to a minimum 300 MHz controller.

Figure 113: Quad BRI Framer

RJ-45 Pin Orientation

The RJ-45 connector is used for Ethernet, CIM, Music on Hold, Paging, RS-232 Maintenance ports, and E1 and T1 interfaces.

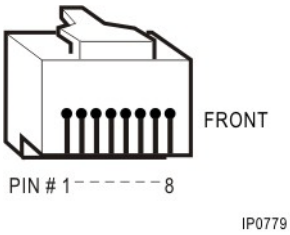


Figure 114: RJ-45 pin orientation

Analog Board (MX Controller)

The Analog Boards provide connectivity for analog trunks and telephones (POTS and On-Premise Station, ONS).

Table 25: Embedded Analog - Circuits/Ports

Circuits/Ports	Analog Main Board	Analog Option Board
LS CLASS Circuits	6	6
ONS CLASS Circuits	2	2
Power Fail Transfer Circuits	2	0
Music On Hold Port	1	0
Loudspeaker Port	1	0

Table 26: Embedded Analog Cabinet Configuration

Slot	Card Type
1	Hybrid LS ONS (6 LS + 2 ONS)
2	Hybrid LS ONS (6 LS + 2 ONS) optional
3	1 Port E & M Trunk
4	1 Port Loudspeaker Pager
5	No card present
6	ASU Controller
7	Copper I/F

Table 27: Embedded Analog Music on Hold Connector Pinout

Conductor	Signal	Virtual Circuit PLID
Shield	MOH_COM	4 1 3 1
Ring	MOH_1	
Tip	MOH_2	
Note: The Music On Hold port uses a 3.5mm stereo jack for input signal connection. It will also accept a 3.5mm mono plug. The two input signals are equivalent to the left and right channel signals from a stereo source and are combined internally into a single channel.		

Table 28: Embedded Analog Pager Connector Pinout

Pin	Signal	Virtual PLID
1	Common contact	
2	Normally closed contact	
3	Normally open contact	
4	Page1 (Tip)	4 1 4 1
5	Page2 (Ring)	4 1 4 1
6	No connection	
7	Not used	
8	Not used	

Note: The Paging port is an 8-pin RJ-45 connector on the rear panel of the MX controller. The paging port has a tip/ring pair for audio and contact closures for zone control. The normally closed contact opens when paging and the normally open contact closes when paging. See See "RJ-45 Pin Orientation" on page 252..

Table 29: Embedded Analog Amphenol Connector Pinout

Pin	Color Code	Analog Main Board	Analog Option Board	PLID
26/1	W/BL, BL/W	ONS Ring/Tip 1 PFT #1		4-1-1-1
27/2	W/O, O/W	ONS Ring/Tip 2 PFT #2		4-1-1-2
28/3	W/G, G/W		ONS Ring/Tip 3	4-1-2-1
29/4	W/BR, BR/W		ONS Ring/Tip 4	4-1-2-2
30/5 - 35/10 NOT USED				
36/11	BK/BL, BL/BK	LS Ring/Tip 1 PFT #1		4-1-1-3
37/12	BK/O, O/BK	LS Ring/Tip 2 PFT #2		4-1-1-4
38/13	BK/G, G/BK	LS Ring/Tip 3		4-1-1-5
39/14	BK/BR, BR/BK	LS Ring/Tip 4		4-1-1-6
40/15	BK/S, S/BK	LS Ring/Tip 5		4-1-1-7
41/16	Y/BL, BL/Y	LS Ring/Tip 6		4-1-1-8
42/17	Y/O, O/Y		LS Ring/Tip 7	4-1-2-3
43/18	Y/G, G/Y		LS Ring/Tip 8	4-1-2-4
44/19	Y/BR, BR/Y		LS Ring/Tip 9	4-1-2-5

Table 29: Embedded Analog Amphenol Connector Pinout

Pin	Color Code	Analog Main Board	Analog Option Board	PLID
45/20	Y/S, S/Y		LS Ring/Tip 10	4-1-2-6
46/21	V/BL, BL/V		LS Ring/Tip 11	4-1-2-7
47/22	V/O, O/V		LS Ring/Tip 12	4-1-2-8
48/23 - 50/25 NOT USED				

Note: Power Fail Transfer is provided internally between the LS trunks and the ONS lines. Preselected DTMF or rotary telephones can be connected directly to CO trunks in the event of system failure. In the event of a failure, the controller can switch phones on ONS circuits at PLID 4/1/1/1 and 4/1/1/2 to Central Office trunks at PLID 4/1/1/3 and 4/1/1/4.

Analog Board (CX/CXi, CX II/CXi II, and MXe Controllers)

Analog Boards provide connectivity for analog trunks and telephones.

Table 30: Embedded Analog - Circuits/Ports

Circuits/Ports	Analog Main Board CX/CXi, CX II/CX ill and MXe	Analog Option Board CX/CXi only
LS CLASS Circuits	6	6
ONS CLASS Circuits	4	4
Power Fail Transfer Circuits	2	2
Music On Hold Port	1	0
Loudspeaker Port (Page)	1	1

Table 31: Analog Main Board/Analog Option Board Port Assignment

Analog Option Board Ports (CX/CXi, CX II/CXi II only)												
1	1/2	4	3	2	1		1	2	3	4	5	6
PLIDs		4124	4123	4122	4121		4125	4126	4127	4128	4129	41210
Analog Main Board Ports (CX/CXi, CX II/CXi II, and MXe)												
Page	**Relay**	**ONS Ports**					**LS Ports**					
1	1/2	4	3	2	1		1	2	3	4	5	6
n/a	(see note 2)	4114	4113	4112	4111		4115	4116	4117	4118	4119	41110

Notes:
1. AMB PLIDs - PFT#1 ONS 4-1-1-1 -> LS 4-1-1-5; PFT#2 ONS 4-1-1-2 -> LS 4-1-1-6
2. Reserved for future development.

Table 32: Analog Main Board/Analog Option Board Pinouts

Port	Pin Number	Function
LS 1 - 6	3	Ring
	4	Tip

Table 32: Analog Main Board/Analog Option Board Pinouts (continued)

Port	Pin Number	Function
ONS 1 - 4	3	Ring
	4	Tip
ONS 3 - 4	2	Contact sensor
	5	Contact sensor
Relay 1/2 (not used)[1]	3	RLY1_Common
	4	RLY1_NO (normally open)
	6	RLY1_NC (normally closed)
	2	RLY2_Common
	5	RLY2_NO (normally open)
	1	RLY2_NC (normally closed)
Paging	3	Paging signal
	4	Paging signal
	6	Not used
	2	Paging relay common
	5	Paging relay NO (normally open)
	1	Paging relay NC (normally closed)

[1]Reserved for future development.

Table 33: Embedded Analog Music on Hold Connector Pinout

Conductor	Signal	Virtual Circuit PLID
Shield	MOH_COM	4 1 3 1
Ring	MOH_1	
Tip	MOH_2	

Note: The Music On Hold port requires a 3.5 mm stereo jack for input signal connection. The two input signals are equivalent to the left and right channel signals from a stereo source and are combined internally into a single channel.

Line Cards (AX Controller)

The AX controller line cards are the same as those for the ASU II. See Table 46: ASU II/AX Line Card Lock Latch Color Code (page 266), Table 47: ASU II/AX 25-Pair Male D-Type Connector Pinout (page 267), and Table 49: ASU II/AX Combo Card SFT/PFT Port Connections (page 269).

Controller Alarm Port Pinouts

Tip: The alarm port is not available on the AX, CX/CXi, and CX II/CXi II controllers.

Table 34: Controller Alarm Port Pinout

Pin	Signal	Pin	Signal
1	Critical Alarm	6	Not Used
2	Critical Alarm Return	7	Minor Alarm
3	Not Used	8	Minor Alarm Return
4	Major Alarm	9	Not Used
5	Major Alarm Return		

Notes:
1. Contacts closed when alarm is present
2. Loss of power to the controller trips (closes) the Critical Alarm relay.

Controller Remote Alarm Behavior

Table 35: Controller Remote Alarm Behavior

Action	Behavior
Power-up or push-button reset	Remote alarms are enabled by default and the LED is turned off. Press the remote alarm button to disable remote alarms. Disabled when the LED is ON.
Software-activated reboot	Remote alarms remain in the state they were in prior to the reboot.
Software Install or Upgrade	If remote alarms are disabled, an install/upgrade may enable the alarms.
Power failure	When the system comes back up, the remote alarm will be enabled, by default.

Network Services Units

The Network Services Unit provides connectivity to digital trunks.

There are three variants of the NSUs:

- Universal NSU
- R2 NSU
- BRI NSU

Universal/R2 NSU

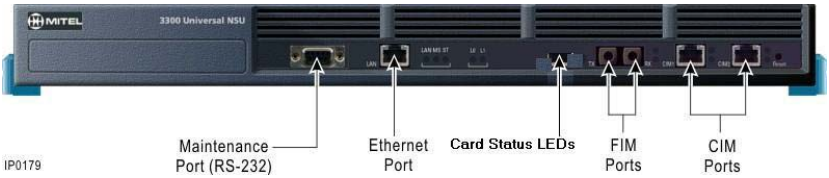


Figure 115: Universal NSU – Front Panel

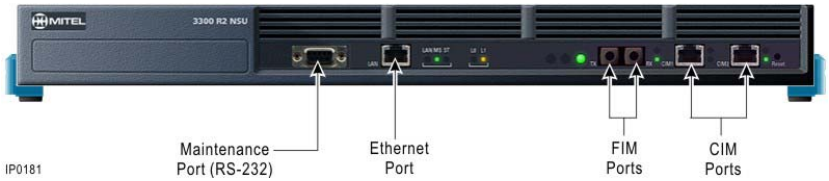


Figure 116: R2 NSU – Front Panel

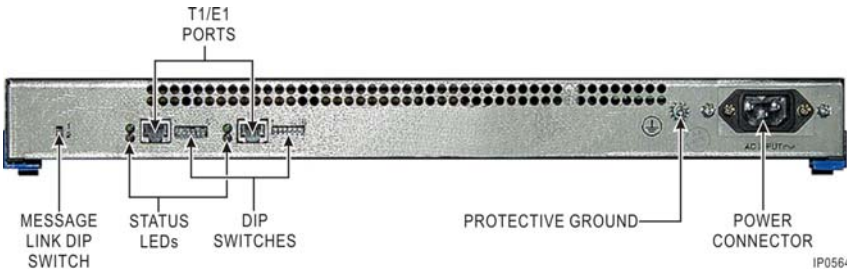


Figure 117: Universal/R2 NSU – Back Panel

Universal and R2 NSU DIP Switch Settings

Table 36: Message Link DIP Switch Setting

DIP Switch	Use	Notes
Rear panel, left side	Primary NSU	Set to 1 (up). Connected to the controller
	Secondary NSU	Set to 2 (down). Connected to another NSU

Table 37: T1/E1 Ports DIP Switches Defined

DIP Switch	Use	Notes
1	Tx Ground	Ground when down; floating when up.
2	Rx Ground	Ground when down; floating when up.
3	Impedance selector #1	120 ohm (enabled when down).
4	Impedance selector #2	100 ohm (enabled when down).
5	Impedance selector #3	75 ohm (enabled when down).
6	LT/NT selector	Up for NT; down for LT.

Table 38: T1/E1 Ports DIP Switch Settings

Impedance (ohms)	Trunk Mode	1 Tx Gnd	2 Rx Gnd	3 120 ohm	4 100 ohm	5 75 ohm	6 LT/NT
100	T1 (T1/D4)	Up	Up	Up	Down	Up	Up/Down
120	E1 (PRI)	Up	Up	Down	Up	Up	Up/Down
75	E1 (R2)	Note	Note	Up	Up	Down	Up/Down

Note: The **Ground** setting is site-dependent. Normally, Tx is grounded and Rx is not grounded, but that depends on which remote connection is grounded. These switches are used only with the coaxial adapter (BNC adapter required); leave up (floating) for twisted pair connection to the E1 port.
Note: See for Table 42 on page 262 for T1 and E1 Connector Pin Allocation for setting dip switch 6, LT/NT.

Universal and R2 NSU Pin Allocations

Table 39: Quad[1] or Single CIM Port Connector[2] (Controller and ASU)

RJ-45 Connector Pin	Signal Name
1	RX+
2	RX-
3	TX+
4	Not used
5	Not used
6	TX-
7	Not used
8	Not used

Notes:
1: One or two Quad CIMs can be installed in any 3300 ICP controller to provide for connection to a maximum of 12 ASUs, with the exception of the CX/CXi and CX II/CXi II which support only the first three ports of one Quad CIM module, and the AX controller which support four ports on one module.
2: The Universal ASU connects to the controller over a Category 5 Unshielded Twisted Pair (UTP) crossover cable through a CIM interface. The Category 5 cable is of the same type used for Ethernet connections and within the cable twisted pairs are arranged as: 1,2: 3,6; 4,5; 7,8. Each tied pair is connected to a 75 ohm resistor. The Universal ASU can be located up to 30 meters (98.4 feet) away from the controller. The interface employs a single standard 8-pin modular jack consisting of 2 balanced signal pairs and is located on the front of the unit.

Table 40: Ethernet Connector

RJ-45 Connector Pin	Signal Name
1	TX+
2	TX-
3	RX+
4	Not used
5	Not used
6	RX-
7	Not used
8	Not used

Table 41: RS-232 Maintenance Connector

RJ-45 Connector Pin	Signal Name
1	DCD (data carrier detector)
2	RXD (receive data)
3	TXD (transmit data)
4	DTR (data terminal ready)
5	GND (ground)
6	DSR (data set ready)
7	RTS (ready to send)
8	CTS (clear to send)
9	Not used

Table 42: T1 and E1 Connector Pin Allocation

RJ-45 Connector Pin	Signal Name	
	NT Mode: Switch-6 UP	LT Mode: Switch-6 DOWN
1	RX Ring	TX Ring
2	RX Tip	TX Tip
3	Unused	Unused
4	TX Ring	RX Ring
5	TX Tip	RX Tip
6	Unused	Unused
7	Unused	Unused
8	Unused	Unused

Table 43: NSU Trunk Type Programming Information

NSU	Protocol	Link Descriptor (Integrated Access)	MSDN Trunk Circuit Descriptor Type
Universal T1/E1	T1/E1 PRI/QSIG	ISDN Node	Universal T1 Universal E1
Universal T1	T1 E&M	T1D4	Universal T1
Universal T1/E1	T1/E1 MSDN	DPNSS	Universal T1 Universal E1
R2	R2	ISDN Node	R2

BRI NSU

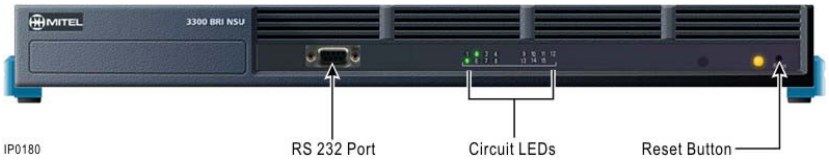


Figure 118: BRI NSU – Front Panel

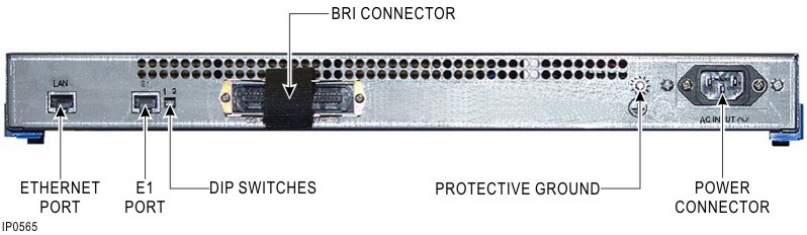


Figure 119: BRI NSU – Back Panel

Table 44: BRI Connector Pinout (Amphenol 25-pin)

Pin	Signal	Pin	Signal	Pin	Signal
1	T1	11	T11	31	R6
2	T2	12	T12	32	R7
3	T3	13	T13	33	R8
4	T4	14	T14	34	R9
5	T5	15	T15	35	R10
6	T6	26	R1	36	R11
7	T7	27	R2	37	R12
8	T8	28	R3	38	R13
9	T9	29	R4	39	R14
10	T10	30	R5	40	R15

BRI NSU DIP Switch Settings

Table 45 below shows the settings for the CEPT port DIP switch for the BRI NSU.

Table 45: CEPT Mode - E1 Port DIP Switch Settings

Switch	Use	Setting	Notes
1	Tx Ground	Up: Floating Down: Ground	Not required for RJ-45 connector.
2	Rx Ground	Up: Floating Down: Ground	Not required for RJ-45 connector
Note: This setting is site-dependent. Normally Tx is grounded and Rx is not grounded, but that depends on which remote connection is grounded. These switches are used only with the coaxial adapter; leave up (floating) with twisted pair connection. Not required for RJ-45 connector.			

Analog Services Unit

The Analog Services Unit (ASU) provides connectivity for analog trunks and telephones (POTS and On-Premise Station, ONS). There are three variants of 3300 ASUs:

- ASU
- Universal ASU
- ASU II (only on systems running Release 7.0 and later).

For information specific to embedded analog, refer to page 253.

Figure 120: ASU – Front Panel

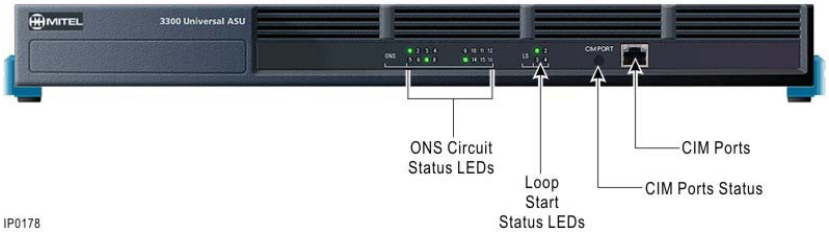


Figure 121: Universal ASU – Front Panel

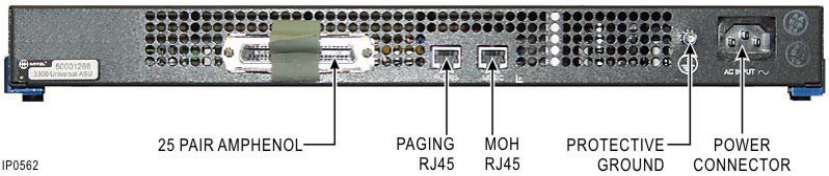


Figure 122: Universal ASU – Back Panel

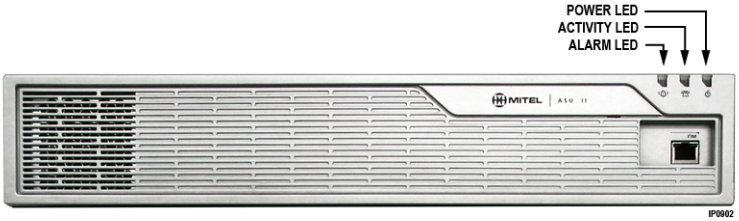


Figure 123: ASU II – Front Panel

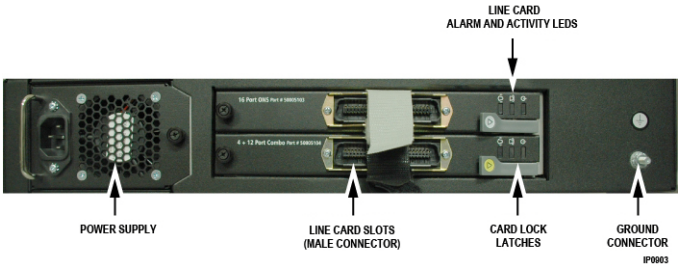


Figure 124: ASU II – Back Panel with a Line Card

There are three line cards available for the ASU II:

- 24 Port ONSP card
- 16 port ONSP card
- 4 + 12 port Combo card (4 LS trunks and 12 ONS lines).

Table 46: ASU II/AX Line Card Lock Latch Color Code

Card Type	Latch Color
24 and 16 Port ONSP Cards	White
4 + 12 Port Combo	Green

Table 47: ASU II/AX 25-Pair Male D-Type Connector Pinout

Pin	Color Code	16 port and 24 port ONS	PLID	4 + 12 port Combo	PLID
26/1	W/BL, BL/W	ONS Tip/Ring 1	n 1 x 1	ONS Tip/Ring 1	n 1 x 1
27/2	W/O, O/W	ONS Tip/Ring 2	n 1 x 2	ONS Tip/Ring 2	n 1 x 2
28/3	W/G, G/W	ONS Tip/Ring 3	n 1 x 3	ONS Tip/Ring 3	n 1 x 3
29/4	W/BR, BR/W	ONS Tip/Ring 4	n 1 x 4	ONS Tip/Ring 4	n 1 x 4
30/5	W/S, S/W	ONS Tip/Ring 5	n 1 x 5	ONS Tip/Ring 5	n 1 x 5
31/6	R/BL, BL/R	ONS Tip/Ring 6	n 1 x 6	ONS Tip/Ring 6	n 1 x 6
32/7	R/O, O/R	ONS Tip/Ring 7	n 1 x 7	ONS Tip/Ring 7	n 1 x 7
33/8	R/G, G/R	ONS Tip/Ring 8	n 1 x 8	ONS Tip/Ring 8	n 1 x 8
34/9	R/BR, BR/R	ONS Tip/Ring 9	n 1 x 9	ONS Tip/Ring 9	n 1 x 9
35/10	R/S, S/R	ONS Tip/Ring 10	n 1 x 10	ONS Tip/Ring 10	n 1 x 10
36/11	BK/BL, BL/BK	ONS Tip/Ring 11	n 1 x 11	ONS Tip/Ring 11	n 1 x 11
37/12	BK/O, O/BK	ONS Tip/Ring 12	n 1 x 12	ONS Tip/Ring 12	n 1 x 12
38/13	BK/G, G/BK	ONS Tip/Ring 13	n 1 x 13	N/C	
39/14	BK/BR, BR/BK	ONS Tip/Ring 14	n 1 x 14	N/C	
40/15	BK/S, S/BK	ONS Tip/Ring 15	n 1 x 15	N/C	
41/16	Y/BL, BL/Y	ONS Tip/Ring 16	n 1 x 16	N/C	
42/17	Y/O, O/Y	ONS Tip/Ring 17	n 1 x 17	N/C	
43/18	Y/G, G/Y	ONS Tip/Ring 18	n 1 x 18	N/C	
44/19	Y/BR, BR/Y	ONS Tip/Ring 19	n 1 x 19	N/C	
45/20	Y/S, S/Y	ONS Tip/Ring 20	n 1 x 20	N/C	
46/21	V/BL, BL/V	ONS Tip/Ring 21	n 1 x 21	LS Ring/Tip 1	n 1 x 13
47/22	V/O, O/V	ONS Tip/Ring 22	n 1 x 22	LS Ring/Tip 2	n 1 x 14
48/23	V/G, G/V	ONS Tip/Ring 23	n 1 x 23	LS Ring/Tip 3	n 1 x 15
49/24	V/BR, BR/V	ONS Tip/Ring 24	n 1 x 24	LS Ring/Tip 4	n 1 x 16
50/25	V/S, S/V			N/C	

Table 47: ASU II/AX 25-Pair Male D-Type Connector Pinout (continued)

Pin	Color Code	16 port and 24 port ONS	PLID	4 + 12 port Combo	PLID
Note: In the PLID column, n represents the unit number and x represents the number of the slot in which the card is installed (either one or two). **Note:** ONS Tip/Ring 17 to ONS Tip/Ring 24 apply to 24-port ONS card only. **Note:** There is a limit the number of ONS ports on a single card that belong to a specific suite or ring group. When you connect ports that will be configured as part of a common suite or ring group, spread the ports across multiple cards, with a maximum of three ports on any one card.					
Page 2 of 2					

Table 48: ASU 25-Pair D-Type Connector Pinout

Pin	Color Code	ASU	PLID	Universal ASU	PLID
26/1	W/BL, BL/W	ONS Ring/Tip 1	n 1 1 1	ONS Ring/Tip 1	n 1 1 1
27/2	W/O, O/W	ONS Ring/Tip 2	n 1 1 2	ONS Ring/Tip 2	n 1 1 2
28/3	W/G, G/W	ONS Ring/Tip 3	n 1 1 3	ONS Ring/Tip 3	n 1 1 3
29/4	W/BR, BR/W	ONS Ring/Tip 4	n 1 1 4	ONS Ring/Tip 4	n 1 1 4
30/5	W/S, S/W	ONS Ring/Tip 5	n 1 1 5	ONS Ring/Tip 5	n 1 1 5
31/6	R/BL, BL/R	ONS Ring/Tip 6	n 1 1 6	ONS Ring/Tip 6	n 1 1 6
32/7	R/O, O/R	ONS Ring/Tip 7	n 1 1 7	ONS Ring/Tip 7	n 1 1 7
33/8	R/G, G/R	ONS Ring/Tip 8	n 1 1 8	ONS Ring/Tip 8	n 1 1 8
34/9	R/BR, BR/R	ONS Ring/Tip 9	n 1 2 1	ONS Ring/Tip 9	n 1 2 1
35/10	R/S, S/R	ONS Ring/Tip 10	n 1 2 2	ONS Ring/Tip 10	n 1 2 2
36/11	BK/BL, BL/BK	ONS Ring/Tip 11	n 1 2 3	ONS Ring/Tip 11	n 1 2 3
37/12	BK/O, O/BK	ONS Ring/Tip 12	n 1 2 4	ONS Ring/Tip 12	n 1 2 4
38/13	BK/G, G/BK	ONS Ring/Tip 13	n 1 2 5	ONS Ring/Tip 13	n 1 2 5
39/14	BK/BR, BR/BK	ONS Ring/Tip 14	n 1 2 6	ONS Ring/Tip 14	n 1 2 6
40/15	BK/S, S/BK	ONS Ring/Tip 15	n 1 2 7	ONS Ring/Tip 15	n 1 2 7
41/16	Y/BL, BL/Y	ONS Ring/Tip 16	n 1 2 8	ONS Ring/Tip 16	n 1 2 8
42/17	Y/O, O/Y	ONS Ring/Tip 17	n 1 3 1	LS Ring/Tip 1	n 1 3 1
43/18	Y/G, G/Y	ONS Ring/Tip 18	n 1 3 2	LS Ring/Tip 1-1	1 MPD
Page 1 of 2					

Table 48: ASU 25-Pair D-Type Connector Pinout (continued)

Pin	Color Code	ASU	PLID	Universal ASU	PLID
44/19	Y/BR, BR/Y	ONS Ring/Tip 19	n 1 3 3	LS Ring/Tip 2	n 1 3 2
45/20	Y/S, S/Y	ONS Ring/Tip 20	n 1 3 4	LS Ring/Tip 1-2	2 MPD
46/21	V/BL, BL/V	ONS Ring/Tip 21	n 1 3 5	LS Ring/Tip 3	n 1 3 3
47/22	V/O, O/V	ONS Ring/Tip 22	n 1 3 6	LS Ring/Tip 1-3	3 MPD
48/23	V/G, G/V	ONS Ring/Tip 23	n 1 3 7	LS Ring/Tip 4	n 1 3 4
49/24	V/BR, BR/V	ONS Ring/Tip 24	n 1 3 8	LS Ring/Tip 1-4	4 MPD
50/25	V/S, S/V	N/C		N/C	

Note: In the PLID column, n represents the unit number: LX is 2 - 5; MX is 2 and 3. The LS Ring/Tip 1-n connections are used in the UK for Meter Pulse Detection (MPD). These ports should be wired across the corresponding LS Ring/Tip connection of the trunk. We recommend that the MPD connections are made at the last hard wired point.

Page 2 of 2

Table 49: ASU II/AX Combo Card SFT/PFT Port Connections

LS Port	ONS Port
1	1
2	2
3	3
4	4

Note: Up to four SFT/PFT calls can occur at the same time between pairs of LS and ONS ports. ONS is supported against an LS trunk.

Table 50: Universal ASU Music on Hold Connector Pinout

Pin	Signal	Virtual Circuit
1/2	Tip/Ring 1	*n* 1 4 1
3/6	Tip/Ring 2	*n* 1 4 2
4/5	Tip/Ring 3	*n* 1 4 3
7/8	Tip/Ring 4	*n* 1 4 4

Note: CIM 1: *n* = 2. CIM 2: *n* = 3.
Note: The four MOH tip/ring pairs occupy an 8-pin female modular jack on the rear panel. MOH can be assigned to either of the first two ports on a Universal ASU E&M card.

Table 51: Universal ASU Pager Connector Pinout

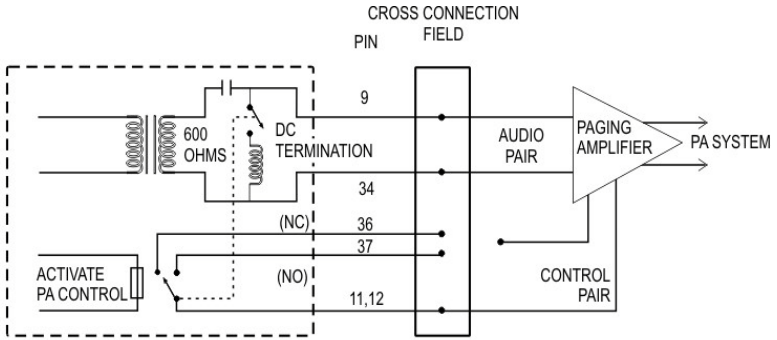
Pin	Signal	Zone	Virtual Circuit
1	Tip	00	n 1 5 1
2	Ring	00	n 1 5 1
3	Common contact	00	
4	Tip	01	n 1 5 2
5	Ring	01	n 1 5 2
6	Normally open contact	00	
7	Common contact	01	
8	Normally open contact	01	

Note: CIM 1: *n* = 2. CIM 2: *n* = 3.
Note: The Paging port is a standard 8-pin modular RJ-45 connector on the rear panel.
Note: Each paging port has a tip/ring pair for audio and a second tip/ring pair contact closures for zone control. The contact closes when paging on zones.

5485 IP Paging Unit

Table 52: 5485 IP Paging Unit Pinout

Pin	Color Code	Signal
9	BR/R	Audio output, Positive
34	R/BR	Audio output, Negative
36	BK/BL	Relay Closure (normally closed)
37	BK/O	Relay Closure (normally open)
11	BL/BK	Page Control input
12	O/BK	



NOTE 1. All wiring must be done in accordance with the National Electrical Code (USA) or Canadian Electric Code and/or local electrical inspection authorities.

NOTE 2. Relay contacts may be connected only to a low voltage secondary circuit (60V@100mA max.). Under no circumstances should these contacts be used to switch primary AC power.

LL0036

Figure 125: 5485 IP Paging Unit Cross Connection

SX-200 Bay

The SX-200 Bay provides connectivity for up to 96 analog and digital sets, including ONS, OPS, and Mitel SUPERSET 4000 series telephones; the SUPERCONSOLE 1000; and the PKM 12 and PKM 48.

For a complete list of supported devices, see the *3300 ICP Hardware Technical Reference.*

Table 53: SX-200 Bay Tip and Ring Assignments

J1, J2, J3, and J4			Lead Designation			
Slot / Plug	**Pin**	**Pair**	**Cct**	**ONS or DNI**	**Cct**	**OPS**
	26	W-BL	1	T1	1	T1
	1	BL-W		R1		R1
	27	W-O	2	T2		
2-J1	2	O-W		R2		
or	28	W-G	3	T3	2	T2
4-J2	3	G-W		R3		R2
or	29	W-BR	4	T4		
6-J3	4	BR-W		R4		
or	30	W-S	5	T5	3	T3
8-J4	5	S-W		R5		R3
	31	R-BL	6	T6		
	6	BL-R		R6		
	32	R-O	7	T7	4	T4
	7	O-R		R7		R4
	33	R-G	8	T8		
	8	G-R		R8		
	34	R-BR	9	T9	5	T5
	9	BR-R		R9		R5
	35	R-S	10	T10		
	10	S-R		R10		
	36	BK-BL	11	T11	6	T6
	11	BL-BK		R11		R6
	37	BK-O	12	T12		
	12	O-BK		R12		

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Table 53: SX-200 Bay Tip and Ring Assignments (continued)

J1, J2, J3, and J4			Lead Designation			
Slot / Plug	**Pin**	**Pair**	**Cct**	**ONS or DNI**	**Cct**	**OPS**
	38	BK-G	SPARE			
	13	G-BK	SPARE			
	39	BK-BR	1	T1	1	T1
	14	BR-BK		R1		R1
	40	BK-S	2	T2		
1-J1	15	S-BK		R2		
or	41	Y-BL	3	T3	2	T2
3-J2	16	BL-Y		R3		R2
or	42	Y-O	4	T4		
5-J3	17	O-Y		R4		
or	43	Y-G	5	T5	3	T3
7-J4	18	G-Y		R5		R3
	44	Y-BR	6	T6		
	19	BR-Y		R6		
	45	Y-S	7	T7	4	T4
	20	S-Y		R7		R4
	46	V-BL	8	T8		
	21	BL-V		R8		
	47	V-O	9	T9	5	T5
	22	O-V		R9		R5
	48	V-G	10	T10		
	23	G-V		R10		
	49	V-BR	11	T11	6	T6
	24	BR-V		R11		R6
	50	V-S	12	T12		
	25	S-V		R12		

Appendix B

Installation Planner

Reserved IP Addresses

Table 54 identifies the IP addresses that are reserved for the Analog Main Board (AMB) and the CIMs on the ASUs and ASU IIs.

Table 54: Reserved IP Addresses

Prior to Release 7.0	Release 7.0 and later
192.168.10.0 *to* 192.168.10.15	169.254.10.0 *to* 169.254.10.15
192.168.11.0 *to* 192.168.11.15	169.254.11.0 *to* 169.254.11.15
192.168.12.0 *to* 192.168.12.15	169.254.12.0 *to* 169.254.12.15
192.168.13.0 *to* 192.168.13.15	169.254.13.0 *to* 169.254.13.15
	169.254.14.0 *to* 169.254.14.15
	169.254.15.0 *to* 169.254.15.15
	169.254.16.0 *to* 169.254.16.15
	169.254.17.0 *to* 169.254.17.15
	169.254.18.0 *to* 169.254.18.15
	169.254.19.0 *to* 169.254.19.15
	169.254.20.0 *to* 169.254.20.15
	169.254.21.0 *to* 169.254.21.15
	169.254.22.0 *to* 169.254.22.15
	169.254.23.0 *to* 169.254.23.15
	169.254.24.0 *to* 169.254.24.15
	169.254.25.0 *to* 169.254.25.15
	169.254.26.0 *to* 169.254.26.15
	169.254.27.0 *to* 169.254.27.15
	169.254.28.0 *to* 169.254.28.15
	169.254.29.0 *to* 169.254.29.15
	169.254.30.0 *to* 169.254.30.15

The addresses are assigned on a first-come, first-served basis. Under normal conditions, the AMB gets the first address assigned and after that, each CIM is assigned an address as the CIM is used.

MXe Server/MXe/AX/CXi/CXi II Requirements for IP Networking

LAN Requirements

- A subnet with IP addresses reserved for the following:
  - the MXe Server/MXe/AX/CXi/CXi II system
  - the internal Layer 2 switch
  - the system gateway (router on the LAN or the controller itself)
  - static IP addresses or DHCP-assigned addresses for IP phones (DHCP-assigned addressing is recommended).
- A Dynamic Host Configuration Protocol (DHCP) server within the Broadcast Domain. The CXi, CXi II, and MXe include a DHCP server.

Tip: IP phones/IP devices should only be served by one DHCP server.

- Optional:
  - a router or firewall on the same subnet as the controller. (Note that firewall (including NAT) is on by default for incoming connectivity from the Internet via the WAN port.)
  - external Layer 2 switches (unmanaged for a voice only; managed and VLAN-capable for a voice and data implementation). The CXi and CXi II supports as many switches as are required but you cannot exceed the maximum of 100 IP users.
  - SMTP server address to support e-mail forwarding
  - DNS server address; external DHCP server information;
  - one PC per IP phone (phones must be dual-port models); PCs must have 10/100BaseTx Ethernet cards.

Tip: Layer 2 switches should only be connected to Port 17 on the CXi and CXi II, the left Gigabit port on the CX, CX II, MXe and MXe Server. This rule lessens the chance of spanning tree issues (loops in the network). Either port will work when connecting to the AX.

Tip: IP trunks cannot work through the WAN port.

WAN Requirements

- Internet Gateway (WAN interface) IP address details; program one of the following address assignment methods:

  Static address assignment

  - IP address
  - Subnet Mask
  - Default Gateway

  DHCP address assignment

  - Client name (as required by ISP)
  - Client ID or MAC address (as required by ISP)

  PPPoE address assignment

  - User name
  - Password
- (Optional) Port Forwarding details—i.e., list of IP address and port number for services on internal network that are to be made available to external network.

Other Considerations

- System IP Properties form
  - Reset the controller when you change any settings, except DNS
- LAN Policy (QoS) form
  - Enter the voice VLAN priority (0-7) for expedited forwarding of traffic, which should match the voice priority programmed on the external L2 switches as well as the value programmed for DHCP Option 43 or Option 125 (whichever is used). The data VLAN default is 1. The default voice VLAN priority is 6.
  - Enter the Differentiated Services Code Point Value (DSCP) for voice streaming and signaling. This value should match the value programmed for DHCP Option 43 or Option 125 (whichever is used). Before Release 7.0, the default DSCP value was 44. The new default value is 46. All installations using Release 7.0 or higher software should use a DSCP value of 46.
- Layer 2 Switch form
  - Tag VLAN 1 on Trunk Ports: Select "Enabled" to enable 802.1p/Q VLAN tagging for VLAN 1 on the 10/100/1G LAN port(s). The field

applies to untagged and VLAN 1 tagged packets only; voice VLAN tagging is always preserved.

- IP Routing form
  - When the CXi/CXi II/MXe receives a packet from a host on the LAN, it checks the table. If a route is found on the Network List, the CXi/CXi II/MXe/AX forwards the packet to the system Gateway or a router connected to the local subnet. If no route is found, the CXi/CXi II/MXe/AX forwards the packet to the internet through its WAN interface.

CXi/CXi II/MXe/AX VLAN Behavior

- Default VLAN 1
  - When the CXi/CXi II/MXe/AX is on the default VLAN, it accepts untagged frames and tagged VLAN 1 frames. Any non-VLAN 1 tagged frames are dropped. The CXi/CXi II/MXe/AX treats untagged frames as VLAN 1 frames. The CXi/CXi II/MXe/AX prioritizes traffic based on the priority tag.
  - The CXi/MXe have two priority queues, low (0-3) and high (4-7). The AX has four priority queues. By default untagged frames are placed in the low priority queue. Tagged frames are prioritized according to their priority tagging. On egress, all traffic on all ports is untagged with the exception of port 17 on the CXi/CXi II and the two LAN ports on the MXe, MXe Server and the AX, where the user has the option to tag VLAN1 traffic via the "Tag VLAN 1 on Trunk Port" parameter.
- Voice VLAN
  - When the CXi/CXi II/MXe/AX is programmed with a Voice VLAN, the switch will allow untagged frames and tagged VLAN 1 frames as well as Voice VLAN frames. All other VLAN tagged frames will be dropped. The priority of tagged frames are preserved and queued accordingly. On egress, Voice VLAN traffic is either tagged on all ports (prior to Release 9.0) or configured as tagged or untagged on a port-by-port basis (Release 9.0 and later). Untagged frames are treated as VLAN 1 and forwarded to an external layer 2 switch.
  - CXi/CXi II: When the phones are on the Layer 2 switch of the CXi/CXi II, the phones and the CXi/CXi II switch must be on the same the Voice VLAN for the phones to communicate with the Call Control.

- Data VLAN (CXi - Release 9.0 and later and CXi II)
  - The CXi/CXi II switch can be assigned a data VLAN to override the default VLAN 1. By default, all ports on the CXi/CXi II switch belong to VLAN 1.
  - In addition, VLAN membership can be assigned on a per port basis. Each port can be assigned as tagged or untagged on the data VLAN as well as the Voice VLAN. The default is tagged.

Installation

The traditional installation remains the same as for the MX and LX controllers because the AX, CXi, CXi II, and MXe rely on external routers to perform VLAN routing just as the CX, CX II, MX, and LX do.

An externally managed L2 switch connected to the AX/CXi/CXi II/MXe uplink port(s) must tag Voice VLAN traffic. This is unlike the setup for the other controllers that do not have this requirement.

Controller Configuration Settings (RTC)

Do not change these settings unless you are directed to make changes by an RN. Unauthorized changes may prevent the system from booting up.

Table 55: Controller Configuration Settings

Prompt	Value	Note
boot device	ata=0, 0	Boot device is Disk.
processor number	0	Not used.
host name	bootHost	
file name	ALL platforms, after Rel 8.0: /partition1/RTC8260 or /partition4/RTC8260 ALL platforms, Rel 6.x and 7.x: /partition1/RTC8260 Prior to Rel 6.0: LX/700-user: /partition1/RTC8260 MX: /partition1/Lite200UP 100-user: /partition1/Lite8260 Prior to Release 5.0: 250/700-user: /sysro/RTC8260 100-user: /sysro/Lite8260]	Boot location and file name. File names are case-sensitive.
inet on ethernet (e)	**default IP address: 192.168.1.2:ffffff00**	**IP address and subnet mask (hex) for controller RTC. Provided by your IT administrator.**
inet on backplane (b)		
host inet (h)		IP address of PC used for software upgrades.
gateway inet (g)		**IP address of the default gateway for the 3300 ICP (must be outside the DHCP range).**
user (u)	**ftp**	
ftp password (ftp)	**ftp**	
flags (f)	0x0	Fixed IP address (0x40 used on E2T for DHCP).

Table 55: Controller Configuration Settings (continued)

Prompt	Value	Note
target name (n)		
startup script (s)		
other (o)	qefcc (CX(i) II and MXe III) motfcc (all other controllers)	Dedicated to internal system use. Note that the CX(i) II and MXe III accept motfcc but automatically convert it to qefcc on the next system reboot.
		Page 2 of 2

Tip: Do not use leading zeroes in the IP addresses. For example, enter 192.168.1.2; not 192.168.001.002.

DHCP Configuration Settings

The MXe Server has no internal DHCP and relies on external DHCP, or the internal DHCP of another controller,

Table 56: E2T Static IP Address Programming

Option Name	Value	Notes/Example
Name	Name of E2T	
Subnet	Subnet of E2T	Select subnet.
IP Address	IP address of E2T	192.168.1.5
Protocol	“BOOTP or DHCP”	
Hardware Address:		
Type	MAC Address	
Other - Type	n/a	
Address	MAC address of controller E2T (see the Note)	00:12:3a:4b:c5:67
Other - Address Length	n/a	
Client ID	n/a	
Note: The E2T MAC address is found on the MAC Address label on the rear panel of the ICP. Of the three MAC Address labels on the rear panel, use the one that refers to “E2T MAC”, “Slot 1”.		

Table 57: IP Address Range (Scope) Programming

Option Name	Value	Notes/Example
Name of the range		
Subnet		System-generated
IP Range Start (see note)	Start of scope	192.168.1.15
IP Range End (see note)	End of scope	192.168.1.25
Protocol	Select "None", "BOOTP", "DHCP", or "BOOTP or DHCP"	Default is "BOOTP or DHCP"
Client's class ID must match name	Clear check box.	
Lease Time	2 Weeks	Minimum 5 minutes.
Note: Cannot be modified once form is saved.		

Table 58: Mitel DHCP Server Options

Option ID	Name	Type	Value (notes, example)
3	Router IP address	IP Address.	192.168.1.3
6	DNS server IP address	IP Address	Required for the 5230 IP Appliance.
125 (Applies to Rel. 7.0 and later systems. Option 43 can also be used.)	Vendor Specific Information	ASCII String	Default is "id:ipphone.mitel.com;sw_tftp=192.168.1.2;call_srv=192.168.1.2; vlan=1;l2p=6;dscp=46"
44	NetBIOS name	IP Address	Server IP address. Required for the 5230 IP Appliance.
Page 1 of 3			

Table 58: Mitel DHCP Server Options (continued)

Option ID	Name	Type	Value (notes, example)
66	TFTP Server Name	ASCII String	Required when using an external DHCP Server. Boot Server Host Name (same as RTC IP address, for E2T only).
67	bootfile	ASCII String	Boot file name (for E2T only).
128 (See note)	TFTP Server (usually the controller RTC)	IP Address	IP address of the TFTP server (192.168.1.2)
129 (See note)	RTC IP Address for this controller	IP Address	IP address (192.168.1.2) Enter up to four IP addresses of remote fail-over RTCs. Separate entries with a comma and a space.
130 (See note)	IP Phone DHCP server discrimination string.	ASCII String	MITEL IP PHONE
131 (See note)	IP Phone Analyzer PC	IP Address	
132 (See note)	VLAN ID (optional)	HEX, numeric	2 (for external server, use Hex LONG; for internal server use decimal)
133 (See note)	Priority (optional)	HEX, numeric	6 (for external server, use Hex LONG; or internal server use decimal)
134 (See note)	DiffServ Code Point	Numeric	44 (prior to Rel 6.0) 46 (from Rel 6.0)
140	IP DECT Open Mobility Manager (OMM)	IP Address	IP Address of the primary Radio Fixed Part (RFP)

Table 58: Mitel DHCP Server Options (continued)

Option ID	Name	Type	Value (notes, example)
150	IP DECT secondary OMM	IP Address	IP Address of the secondary Radio Fixed Part (RFP)
151	SpectraLink Voice Priority (SVP) server	IP Address	
Note: Required on Release 7.0 systems to allow IP sets to upgrade to firmware that supports options 125 and 43.			
Page 3 of 3			

Use the settings in Table 59 for all scopes supporting IP voice devices.

Table 59: DHCP Server Configuration Settings

IP Address Scope			
Start Address			
End Address			
Subnet Mask			
Lease Duration	Days:	Hours:	Minutes:
Options (at Subnet Scope for all devices)	**ID**	**Data Type**	**Value**
(Router) Default Gateway	003	IP Address	
Options (at Global Scope for WEB devices)			
DNS Server	006	IP Address	
DNS Domain Name	015	ASCII String	
Options (for 3300 E2T)			
TFTP Server (hostname or IP)	066	ASCII String	Typically the IP address of the controller RTC; System IP address in the case of the MXe Server
TFTP BootFile	067	ASCII String	/sysro/E2T8260
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Table 59: DHCP Server Configuration Settings (continued)

Options (for IP Phones)			
The following two options apply to Release 7.0 and later. The second, Option 125, is the factory-programmed default.			
Vendor Specific Information	43	ASCII String	Default value is, “id:ipphone.mitel.com;sw_tftp=192.168.1.2;call_srv=192.168.1.2; vlan=1;l2p=6;dscp=46”
Vendor-Identifying Vendor-Specific Information	125		
The following 5 options apply to software load prior to Release 7.0.			
IP Phone TFTP Server	128	IP Address	(typically the IP address of the controller RTC)
MN3300 (RTC) IP Address	129	IP Address	
Mitel IP Phone DHCP server	130	ASCII String	MITEL IP PHONE
VLAN ID	132	Internal: Numeric External: Long	2
VLAN Priority	133	Internal: Numeric External: Long	6
Note: Option 128-135 correspond to the following Option 43/125 tags: OptionEquivalent Option 43/125 Tag 128sw_tftp 129call_srv 130id:ipphone.mitel.com 131ipa_srv 132vlan 133l2p 134dscp 135app_proxy The Option 125 string is auto-generated upon upgrade to Release 7.0 provided that Options 128-135 were previously programmed in the DHCP Options form AND Option 130 contains the “MITEL IP PHONE” discrimination string AND there is no option 60 ipphone.mitel.com scope configured in the given subnet.			
Page 2 of 2			

Programming E2T via Debug Cable or Secure Telnet

Use the settings in Table 60 below to program the E2T using a debug cable. The debug (Tapi) cable is an RS-232 serial cable with a PS2 connector at one end and a DB9 connector at the other.

For the MXe and MXe Server, connect to the controller through secure telnet to port 2007.

Tip: Use this section only if you already have a debug cable, and **only if you are directed to do so by Mitel Technical Support**.

Table 60: Debug Cable E2T VxWorks Settings

Prompt	Value	Note
boot device	motfcc or qefcc on the MXe III	Boot device is Network. **Note:** The MXe III accepts motfcc but automatically converts it to qefcc on the next system reboot.
processor number	0	Not used.
host name	bootHost	
file name	/sysro/E2T8260	Boot location and file name.
inet on ethernet (e)		IP address and subnet mask (hex) for controller E2T (for example, 134.199.63.11:ffffff00). Obtain it from your IT administrator.
inet on backplane (b)		
host inet (h)		IP address of controller RTC. Note: System IP for MXe Server
gateway inet (g)		IP address of the end user's default gateway for the 3300 ICP (must be outside the DHCP range).
user (u)	ftp	
ftp password (ftp)	@	
flags (f)	0x0	Fixed IP address (0x40 used on E2T for DHCP).
target name (n)		
		Page 1 of 2

Table 60: Debug Cable E2T VxWorks Settings (continued)

Prompt	Value	Note
startup script (s)		
other (o)		
		Page 2 of 2

Configuring External DHCP Settings for E2T

Note: This procedure applies to all controllers except the MXe/MXe Server.

You must reserve an IP address for the E2T on the DHCP server; assign options 66 and 67 on the external DHCP (Windows NT) to E2T reserved IP address. During installation of the 3300 ICP you will manually enter a static IP address on the RTC card. The E2T card will send a DHCP broadcast to obtain an IP address from the DHCP server. The DHCP server (internal or external) must be enabled to supply a free IP and option 66 and 67.

In the following procedure examples

- IP subnet for the 3300 ICP network is 10.10.18.0
- RTC (static IP) is 10.10.18.4
- E2T (reserved by DHCP scope) is 10.10.18.58.

To reserve an IP address for the E2T on the external DHCP server:

1. Highlight the Subnet 10.10.18.0 in the DHCP server **DHCP Manager - (Local)** window.
2. Click **Scope** and select **ADD Reservation**.
3. Enter the IP address and MAC address of the E2T. The MAC address is found on the MAC Address label on the rear panel of the ICP. Use the MAC Address label that refers to “E2T MAC” “Slot 1”.
4. Click Add.

To add options 66 and 67 to the E2T card IP address:

1. Highlight the Subnet 10.10.18.0 in the DHCP server **DHCP Manager - (Local)** window.
2. Click **Scope** and select **Active Leases**.
3. In the **Active Leases** dialog box, highlight the reserved IP address and then click **Properties**.

4. Click **Options** in the **Properties** dialog box.
5. In the **DHCP Options: Reservation** window, select **option 066 Boot Server Host Name** and click **Add**.
6. Click **Value** to assign the RTC IP address in the **String** area.
7. In the **DHCP Options: Reservation** window, select **option 067 Bootfile Name** and click **Add**.
8. Click **Value** to specify the path **/sysro/E2T8260** in the **String** area.

Configuring a Windows 2000 or Windows 2003 DHCP Server (Rel 7.0 and later)

Note: For ICP Software releases prior to Rel 7.0, see "Configuring a Windows 2000 DHCP Server (prior to Release 7.0)" on page 403.

Note: Options 128-133 used in previous ICP releases are required to provide backward compatibility with IP sets that have yet to be upgraded with firmware (2.0.0.18 or later) that supports options 124/125 or 60/43. After the upgrade, the old options may be removed to prevent future conflicts with standard use or other vendors' use of these options.

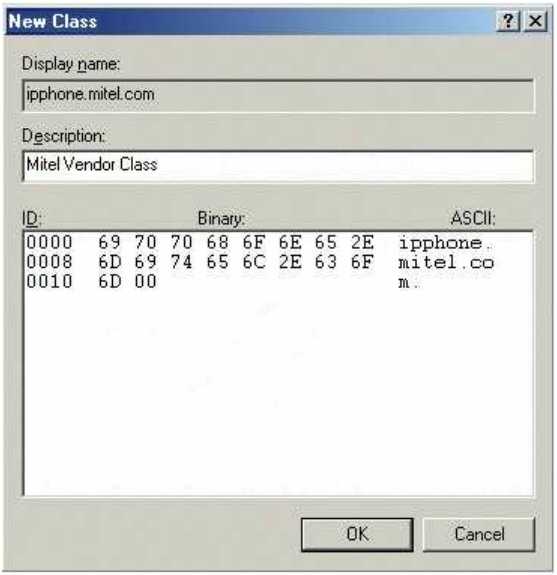
Note: If you intend to rely on LLDP VLAN Discovery in the network, you must first upgrade the 3300 ICP to Release 7.0 or later and upgrade the IP Phone firmware to version 2.0.0.18 or later.

Note: LLDP-MED non-compliant telephones cannot use LLDP for VLAN discovery. They must use DHCP VLAN discovery. Non-compliant sets are: 5001, 5005, 5010, 5020 IP Phones, 5140 IP Appliance, 5201, 5205, 5207, 5215 (single mode), 5220 (single mode), 5230 IP Phones, 5240 IP Appliance, 5485 IP Pager, and 5550 IP Console keypad.

To create Options 60/43 on a Windows 2000 (or Windows 2003) DHCP server:

1. Upgrade the 3300 ICP to Release 7.0.
2. Upgrade the IP Phone firmware. (See page 110).
3. Start DHCP Manager.
4. In the console tree, click the applicable DHCP server branch.
5. Right-click the server, then click **Define Vendor Classes** followed by **Add**.
6. In the **New Class** dialog box, type "Mitel Vendor Class" or other name for the new option.

7. Type “ipphone.mitel.com” in the right side of the text box under **ASCII**.
8. Enter a null terminator (0x00) at the end of the hex string under **Binary**. The completed dialog box should look like this:



IP0927

9. Click **OK**, and then click **Close**.
10. On the **Action** menu, select **Set Predefined Options**.
11. In the **Predefined Options and Values** dialog box, select the Mitel Vendor Class from the Option class list. Click **Add**.
12. In the **Option Type** dialog box, enter the following:

Field name	What to enter...
Name	Mitel Option
Data type	String
Code	001

13. Click **OK**.
14. In the **Predefined Options and Values** dialog box, select 001 Mitel Option as the Option name and enter the Mitel Information Data string with the appropriate values.

15. Enter the Mitel ID string with the appropriate values for <IP address> and <N>,

    id:ipphone.mitel.com;sw_tftp=<*IP address*>;call_srv=<IP address>; dscp=<*N*>;vlan=<*N*>;l2p=<*N*>

    For defaults, see Table 59 on page 286.

Tip: You can use the DHCP Options form in the System Administration Tool to create the configuration string, then copy it into a text editor and modify it as required.

16. Click **OK**.
17. Add the Mitel option to the DHCP scopes that require it, modifying the ID string accordingly.

System Administration Tool Settings

Record the following settings:

- username (default, system): _____
- password (default, password): _____

IP Phone Settings

Record the following setting codes (see System Option Assignment):

- IP set registration code
- IP set replacement code

Telephone Programming Guide

Collect the following information for programming the phones:

- User name
- Location
- Set type
- Number
- MAC Address (optional).

Table 61: Telephone Compression Conditions

Call setup conditions	G729 compression supported	Compression DSP required
IP Phone to IP Phone (except 5x01, 5x05, and 5207)	Yes	No
IP Phone to IP Trunk to IP Phone (except 5x01, 5x05, and 5207)	Yes	No
IP Phone to TDM Phone	Yes	Yes
IP Phone to Embedded voice mail	Yes	Yes
IP Phone in conference	Yes	Yes
IP Phone on Hold, listening to music	Yes	Yes
IP Phone listening to music	No	n/a
TDM Phone to IP Trunk to TDM Phone	Yes	Yes
Direct Set-to-set paging (using first codec)	Yes	No
any call to or from Nupoint IP	No	No
any call to or from Teleworker (See Note)	No	No
any call to or from Mobile Extension (ME) (See Note)	No	No
Note: The application server may support compression for these telephones. Refer to application documentation for more information.		

Increasing DSP Resources

You can add Dual or Quad DSP modules to

- increase the number of voice mail ports
- increase telephony resources to support more TDM devices
- add compression channels (limited applications)

You can add DSP II modules to

- add compression channels
- provide FAX Relay (T.38) support

Tip: Make sure you have the appropriate compression licenses for compression or T.38 licenses for FAX over IP support (FAX Relay) before installing DSP modules.

Note: Installing DSP II module(s) in an MXe controller may define one of the 192 Channel PSTN Gateway configurations that does not allow any embedded Voice Mail ports (see Table 63). If this DSP II module installation is part of an upgrade to an existing system, embedded Voice Mail must be disabled (i.e., moved to another node in the network or an external server) before saving and restoring the database.

About the DSP II Module

In Release 9.0 and later, the DSP II module replaces the earlier DSP modules in some applications. The following conditions apply:

- The DSP II is only supported in the MXe controller, MXe Server, AX controller, CX/CXi, and CX II/CXi II controller. The older MX and LX controllers must still use the Quad DSP module for compression.
- The DSP II supports compression (G.729a) and FAX Relay (T.38). It has replaced the existing DSP module for compression in the MXe and AX controllers. FAX Relay (T.38) is only supported by the DSP II module.
- After a DSP II module is installed in the controller, compression is not supported on any existing installed DSP modules. All compression will be supported by the DSP II module.
- T.38 licenses take precedence over compression licenses. If the combined number of licenses exceeds the DSP II card resources, the T.38 licenses will be loaded first.
- To increase the number of available T.38 channels you must reduce the number of G.729 channels.
- You can increase the number of available T.38 channels by reducing the number of G.729 channels. To obtain the first eight T.38 channels, you must reduce the number G.729 channels by 32. For each additional eight T.38 channels you must reduce the number of G.729 channels by 16.
- The MXe controller now ships with AD21363 DSPs on the motherboard. Earlier versions shipped with AD21262 DSPs on the motherboard. The embedded DSP resources on the controller are sufficient to support all telephony services, conferencing, and voice

mail. However, additional DSPs are required for G.729a compression or FAX Relay (T.38) on either version.

- Installing a DSP II module into a system already upgraded to Release 9.0 or later may generate a Check Bootrom or Check FPGA alarm indicating that the firmware in the module needs to be upgraded. Use the UpgradeBootrom ALL maintenance command in the System Administration Tool to upgrade the firmware.

Table 62 shows the maximum number of G.729 and T.38 channels that are available for use in a single DSP II module in the various systems. Note that the base configuration in the CX/CX II includes the first 8 T.38 channels. A second DSP II module can be added in the MXe for more G.729 channels, but the number of T.38 channels available does not increase.

Table 62: DSP II Channel Capacities

System	G.729	T.38
MXe	128	0
	96	8
	80	16
AX	64	0
	32	8
	16	16
CX/CXi	64	8
CX II/CXi II	64	8

MXe Controller and MXe Server - DSP Resources

The following table identifies the DSP resources available for the MXe controller and MXe Server:

Table 63: MXe, MXe Server, and 192 Channel PSTN Gateway DSP Resources

MXe Configuration	Maximum Resources Supported								
	Dual Framers	E2T Ports	Echo Canceller	G729a Licenses	T.38 Licenses	Max # IP Sets in IP Page	Max # of Conferees	RFC4733 DTMF	Voice Mail
MXe Standard (with 262 DSP) 2 x 161 MMCs, 1 x 128 VEC	2 (96 T1) (120 E1)	64	128	64	0	64[1]	64	64	30
MXe Standard (with 262 DSP) 1 x DSP II, 1 x 128 VEC	2 (96 T1) (120 E1)	64	128	64	16	64[1]	64	64	30
MXe Standard (with 363 DSP) 2 x 161 MMCs	2 (96 T1) (120 E1)	64	64	64	0	64[1]	64	64	30
MXe Standard (with 363 DSP) 1 x DSP II	2 (96 T1) (120 E1)	64	64	64	16	64[1]	64	64	30
MXe Expanded (with 363 DSP) 2 x 161 MMCs 1 x 128 VEC	3 (144 T1) (180 E1)	192	128	64	0	64[2]	64	128	30
MXe Expanded (with 363 DSP) 1 x DSP II, 1 x 128 VEC	3 (144 T1) (180 E1)	192	128	128 (80)	0 (16)	64[2]	64	128	30

Page 1 of 3

Table 63: MXe, MXe Server, and 192 Channel PSTN Gateway DSP Resources (continued)

MXe Configuration	Maximum Resources Supported								
	Dual Framers	E2T Ports	Echo Canceller	G729a Licenses	T.38 Licenses	Max # IP Sets in IP Page	Max # of Conferees	RFC4733 DTMF	Voice Mail
192 Gateway [3] (with 363 DSP) 1 x DSP II, 2 x 128 VEC	3 (144 T1) (180 E1)	192	192	128 (80)	0 (16)	64	64	192	30
192 Gateway [3,4] (with 363 DSP) 2 x DSP II, 1 x 128 VEC	3 (144 T1) (180 E1)	192	192	192	16	64	64	192	0
192 Gateway [3] (with 363 DSP) 2 x DSP II, 2 x 128 VEC	2 (96 T1) (120 E1) + 2 FIM	192	192	192	16	64	64	192	30
192 Gateway [3,4] (with 363 DSP) 1 x DSP II, 1 x 128 VEC	4 (192 T1)	192	192	128 (80)	0 (16)	64	64	192	0
MXe Server (with 363 DSP) 1 x 21161 MMC, 2 x 128 VEC	0	320	256	64	0	64	128	n/a	0
MXe Server (with 363 DSP) 2 x DSP II, 2 x 128 VEC	0	320	256	256	0	64	128	n/a	0

Table 63: MXe, MXe Server, and 192 Channel PSTN Gateway DSP Resources (continued)

MXe Configuration	Maximum Resources Supported								
	Dual Framers	E2T Ports	Echo Canceller	G729a Licenses	T.38 Licenses	Max # IP Sets in IP Page	Max # of Conferees	RFC4733 DTMF	Voice Mail

Notes:

1. All 3300 systems can support a maximum of 64 members in a group page. However, the MXe Standard with 64 E2T channels should restrict the number of members in a group page to less than 32 to reduce the risk of conflict with trunk E2T channels.
2. In these configurations there are always more E2T sessions available than can be used by the T1/E1 trunks, and the full balance of 64 can be used in a group page with no restrictions.
3. The 192 Gateway is not defined in any software setup procedures, but is a special case of the resource allocations based on the specific hardware modules installed.
4. When the system boots up, if it detects either of the following hardware configurations, the number of voice mail ports will be automatically reset to zero:
   - two DSP II modules and one VEC module, or
   - one DSP II module and four dual T1/E1 framers
5. The MXe Controller has been shipped in three different versions since it was introduced. The original version has four AD21262 DSP devices on the main board; the later versions (MXe II and MXe III) have four AD21363 DSP devices. The MXe II and MXe III can be configured as a 192 channel TDM gateway, as shown in this table. Although not shown in this table, it is possible to upgrade the original MXe to a 192 Gateway, but with some limitations since it does not have as much DSP resources available. The original MXe can only be used as a 192 Gateway when a second VEC module is installed. The two options shown for the 192 channel TDM gateway that do not have the second VEC cannot be used, because they will not have enough DSP resources to function properly.

CX/CXi Configurations - DSP Resources

Table 64 and Table 65 list the DSP resources available on the CX/CXi.

Table 64: CX/CXi DSP Configurations with DSP II

Configuration	# of DSPs	Echo Canceller	G729	Conf	E2T	T.38	V21	DTMF Receivers	Voice Mail
Base + two T1/E1 Combo + DSP II	4	74	64	10x3	64	8	64	64	16
Base + Dual 161 + DSP II	4	20	64	10x3	64	8	64	20	16
Base + Dual 161 + T1/E1 Combo + DSP II	5	42	64	10x3	64	8	64	42	16
Base + Quad 161 + T1/E1 Combo + DSP II	7	42	64	10x3	64	8	64	42	16
Base + Dual 161 + Quad BRI + DSP II	4	20	64	10x3	64	8	64	20	16
Base + Dual 161 + CIM + DSP II	4	20	64	10x3	64	8	64	20	16
Base + Quad 161 + Quad BRI + DSP II	6	30	64	10x3	64	8	64	30	16
Base + Quad 161 + CIM + DSP II	6	30	64	10x3	64	8	64	30	16
Note: Compression and T.38 are licensable options and are determined by the number of licenses purchased.									

Table 65: CX/CXi DSP Configurations without DSP II

Configuration	# of DSPs	Echo Canceller	G729	Conf	E2T	T.38	DTMF Receivers	Voice Mail
Base System	2	10	0	3x3	64	0	10	4
Base + one T1/E1 Combo	3	42	0	10x3	64	0	42	16
Base + two T1/E1 Combo	4	74	0	10x3	64	0	64	16
		74	8	10x3	64	0	64	16
Base + Dual 161	4	20	0	10x3	64	0	20	16
		20	8	3x3	64	0	20	4
Base + Dual 161 + T1/E1 Combo	5	42	0	10x3	64	0	42	16
		42	8	10x3	64	0	42	16
		42	16	10x3	64	0	42	16
Base + Quad 161	6	30	0	10x3	64	0	30	16
		30	8	10x3	64	0	30	16
		30	16	3x3	64	0	30	4
Base + Quad 161 + T1/E1 Combo	7	42	0	10x3	64	0	42	16
		42	8	10x3	64	0	42	16
		42	16	10x3	64	0	42	16

Table 65: CX/CXi DSP Configurations without DSP II (continued)

Configuration	# of DSPs	Echo Canceller	G729	Conf	E2T	T.38	DTMF Receivers	Voice Mail

Notes:

1. The number of conference, voice mail, and compression resources is fixed by the purchased option and the number of DSP devices available; the other values are adjustable. Compression alters the number of resources available for the system. For example, by adding 8 compression resources to a system with 4 DSPs total, the maximum number of three-party conferences drops to 3 and the maximum number of voice mail ports drops to 4.
2. The controller supports the G.711 and G.729a audio codecs.'
   - The G.711 PCM audio codec for 56/64 kbps generally provides the best voice quality and is comparable to TDM-type connections.
   - The G.729a audio codec for 8/13 kbps provides a good reduction in bandwidth with only minor loss in voice quality.
   - A purchasable option controls the number of G.729a codecs available to IP devices in the system. Compression enables more devices to share the available bandwidth. The option is purchasable in multiples of 8 to a maximum of 16. The default value is 0.

CX II/CXi II Configurations - DSP Resources

The following tables list the DSP resources available on the CX(i) II with and without a DSP II module installed.

CX II/CXi II DSP Configurations without DSP II

Configuration	# of DSPs	Echo Canceller	G729	Conf	E2T	T.38	DTMF Receivers	Voice Mail
Base System	2	32	0	10x3	64	0	64+	16
Base + one T1/E1 Combo	3	64	0	10x3	64	0	64+	16
Base + two T1/E1 Combo	4	96	0	10x3	64	0	64+	16

Note: The number of voice mail and conference channels is fixed at 16 and 30 respectively.

CX II/CXi II DSP Configurations with DSP II

Configuration	# of DSPs	Echo Canceller	G729	Conf	E2T	T.38	V21	DTMF Receivers	Voice Mail
Base + DSP II	8	32	64	10x3	64	8	64	64+	16
Base + one T1/E1 Combo + DSP II	9	64	64	10x3	64	8	64	64+	16
Base + two T1/E1 Combo + DSP II	10	96	64	10x3	64	8	64	64+	16
Note: Compression and T.38 are licensable options and are determined by the number of licenses purchased.									

DSP Notes

Voice mail:

- Program the additional voice mail ports, then add the DSP MMCs if necessary (for the MXe Server, AX, and MXe, you need to add DSP resources only if you need compression or FAX Relay (T.38)).

Note: Voice mail on the AX requires installation of the Voice Mail Flash.

- With Release 5.0, voice mail ports support G.729a compression. When you increase the number of ports you may also have to add DSPs to handle the increased demand for compression.

Compression:

- You must purchase compression licenses before adding DSP modules for compression.
- Upgrading to 64 compression channels requires a minimum 300 MHz controller (see "Upgrading to a 700-User Controller", page 410).

Telecom:

If the system needs compression channels and/or 30 voice mail ports and/or increased telephony resources to support more TDM devices, then additional DSPs may be necessary. (see "Hardware Part Numbers" on page 377 for the part numbers of the DSP modules).

To determine the number of DSP modules required in a system, refer to the table above.

- MXe Server ships with two Quad Echo Canceller Modules.
- MXe and AX controllers ship with embedded DSP sufficient to support a 400-user system
- CX/CXi and CX II/CXi II (IP plus analog) controllers ship with a Dual Embedded DSP on the main board. The T1/E1 Combo also includes DSP resources.

Tip: Voice mail ports support G.711 and G.729a compression. This applies to all types of voice mail ports, including RAD, Music on Hold, Auto Attendant, and Record-a-call.

Appendix C

Typical Network Configurations

Network Configuration Examples

This section shows examples of the three most common, non-resilient, network configurations for a 3300 ICP LX, MX, CX, CX II, 250/700-User:

- Configuration 1: One DHCP Server per VLAN (below)
- Configuration 2: One DHCP Server for Two VLANs (page 310)
- Configuration 3: Router on a Stick (one router interface to multiple VLANs) (page 311).

Note: See “CXi/CXi II/MXe/MXe Server Configuration” on page 313 for CXi/CXi II-specific configuration examples.

Note: “AX Configuration Procedures” on page 318 illustrates the two most common AX system configurations.

DHCP Server Settings

For each of the configurations shown in this chapter,

DHCP Server Settings (Example)

The following settings must be programmed in the DHCP server:

- DHCP IP Address Range
- Subnet Mask
- Option 03 (Router)
- Option 125 or 43 (Mitel configuration string)
- Option 128 (TFTP Server IP Address)
- Option 129 (RTC IP Address)
- Option 130 (MITEL IP PHONE)
- Option 132 (VLAN ID)
- Option 133 (Priority)

Note: Option 125 (preferred) or Option 43 should be used for Release 7.0. Options 128-133 may be required for backward compatibility during upgrades. For earlier releases, use options 128-133.

Tip: See “Configuring a Windows 2000 DHCP Server (prior to Release 7.0)” on page 403 and “Configuring a Windows 2000 or Windows 2003 DHCP Server (Rel 7.0 and later)” on page 290 for information on programming 3300 DHCP settings on a Windows 2000 DHCP server.

Configuration 1: One DHCP Server per VLAN

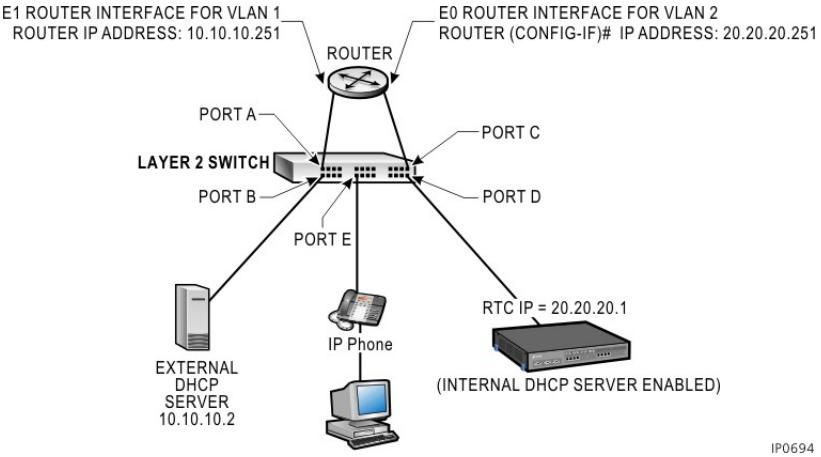


Figure 126: One DHCP Server per VLAN - Example

Table 66 shows the DHCP settings programmed for this configuration.

Table 66: DHCP Settings Example - Configuration 1

Setting	DHCP Server on VLAN 1 (IP: 10.10.10.2) Scope 1	Internal DHCP Server on Controller Scope 1
DHCP	10.10.10.10 to 10.10.10.100	20.20.20.10 to 20.20.20.100
Subnet	255.255.255.0	255.255.255.0
Opt. 03	10.10.10.251	20.20.20.251
Opt 125 or 43 (Rel. 7.0>)	id:ipphone.mitel.com;sw_tftp=20.20.20.1;call_srv=20.20.20.1; vlan=2;l2p= 6;dscp=46;vlan=1;l2p=6;dscp=46;	
Opt. 128*	20.20.20.1	20.20.20.1
Opt. 129*	20.20.20.1	20.20.20.1
Opt. 130*	MITEL IP PHONE	MITEL IP PHONE
Opt. 132*	2	—
Opt. 133*	6	—
* Required on Release 7.0 systems to allow IP sets to upgrade to firmware that supports options 125 and 43.		

Layer 2 Switch Settings (Example)

Table 67 and Table 68 show examples of settings on a Cisco and an HP Layer 2 switch for this example. See Figure 126 for the port numbers.

Tip: These settings also apply for the other network configuration examples.

Table 67: Cisco Layer 2 Switch Settings Example - Configurations 1, 2 and 3

Port	Use	Command
A	Access port for VLAN 1	None (by default, all ports belong to VLAN 1)
B		
C	Access port for VLAN 2	Router(config-if)#switchport mode access Router(config-if)#switchport access VLAN 2
D		
E	Trunk port with Dot1q for IP Phone	Router(config)#interface fast 0/5 Router(config-if)#switchport mode trunk Router(config-if)#switchport trunk encapsulation dot1q

Table 68: HP Layer 2 Switch Settings Example - Configurations 1, 2 and 3

Port	Use	Command (on HP VLAN menu)
A	Access port for VLAN 1	VLAN 1 = untagged VLAN 2 = NO
B		
C	Access port for VLAN 2	VLAN 1 = NO VLAN 2 = untagged
D		
E	Trunk port	VLAN 1 = untagged VLAN 2 = tagged

Note: For additional switch setting examples, refer to to the Network Configuration Specifics chapter in the *3300 ICP Engineering Guidelines*.

Configuration 2: One DHCP Server for Two VLANs

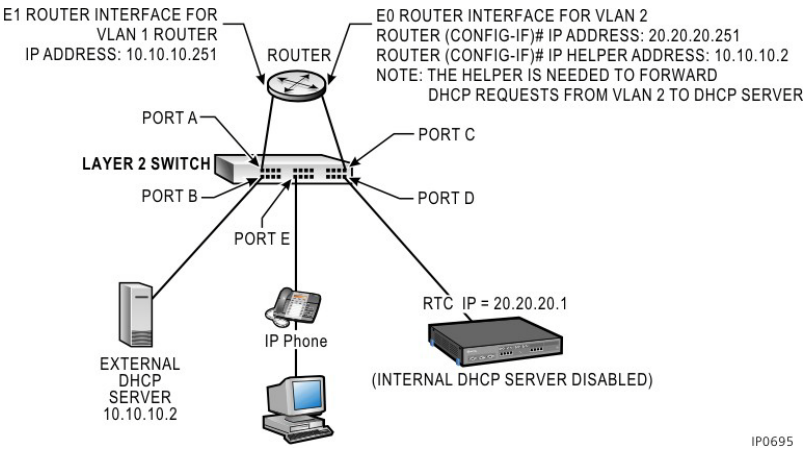


Figure 127: One DHCP Server for two VLANs - Example

Table 69 shows the DHCP settings programmed for this configuration.

Table 69: DHCP Settings Example - Configurations 2 and 3

Setting	DHCP Server on VLAN 1 (IP: 10.10.10.2)	
	Scope 1	Scope 2
DHCP	10.10.10.10 to 10.10.10.100	20.20.20.10 to 20.20.20.100
Subnet	255.255.255.0	255.255.255.0
Opt. 03	10.10.10.251	20.20.20.251
Opt 125 or 43 (Rel. 7.0>)	id:ipphone.mitel.com;sw_tftp=20.20.20.1;call_srv=20.20.20.1; vlan=2;l2p= 6;dscp=46;	
Opt. 128*	20.20.20.1	20.20.20.1
Opt. 129*	20.20.20.1	20.20.20.1
Opt. 130*	MITEL IP PHONE	MITEL IP PHONE
Opt. 132*	2	2
Opt. 133*	6	6
* Required on Release 7.0 systems to allow IP sets to upgrade to firmware that supports options 125 and 43.		

Layer 2 Switch Settings (Example)

See “Layer 2 Switch Settings (Example)” on page 309.

Configuration 3: Router on a Stick

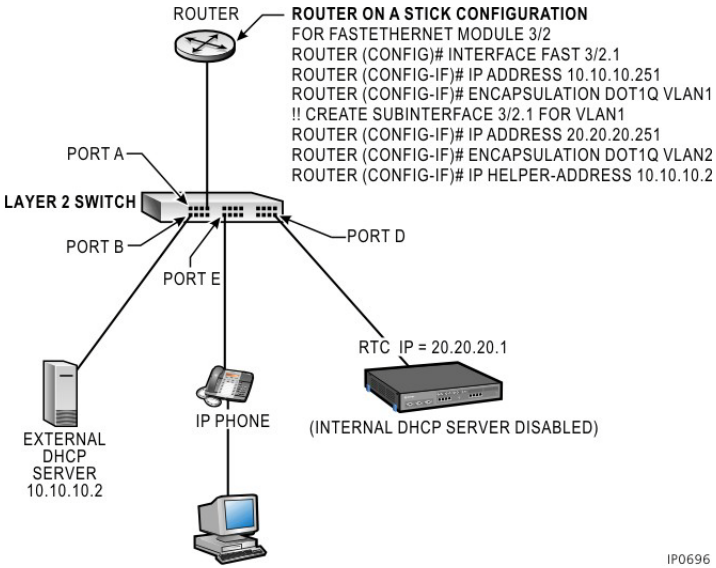


Figure 128: Configuration 3 Example

Table 69 on page 310 shows the DHCP settings for this configuration.

Layer 2 Switch Settings (Example)

See “Layer 2 Switch Settings (Example)” on page 309.

LLDP-MED and IP Phone Network Policy

LLDP-MED stands for Link Layer Discovery Protocol - Media Endpoint Discovery. LLDP-MED is based on VoIP-specific extensions to the IEEE 802.1A LLDP standard. Refer to the Network Configuration chapter in the *3300 ICP Engineering Guidelines* for details.

Cisco Discovery Protocol (CDP)

Prior to Release 5.1 the Mitel IP devices discovered VLAN information dynamically through DHCP. With Release 5.1, Mitel IP device messages are now compatible with Cisco Discovery Protocol (CDP) for the purpose of port duplex and speed settings, port MAC identification and Auxiliary VLAN assignment. If your network uses Cisco Layer 2 switches, you may configure your L2 ports as Access ports and use the auxiliary VLAN to set the voice VLAN, allowing both phones and PC to share the same network port. For more information on configuring your network, refer to the *3300 ICP Engineering Guidelines*, available at http://edocs.mitel.com.

The IP devices understand CDP messages for the following:

- Advertising their in-line power consumption
- Discovering the voice VLAN setting from the Cisco L2 switch
- Advertising their duplex setting, platform, and software release for the "show cdp neighbor" command on the L2 console.

To obtain VLAN information via CDP:

- Set the network part as Access
- Enter the Voice VLAN, or the Auxiliary_VLAN setting
- Enter the data or default VLAN into the Native_VLAN setting
- In DHCP there is no requirement to enter VLAN or Priority into the default/data VLAN
- Set the Priority field to "6" in the voice VLAN scope of DHCP.

CXi/CXi II/MXe/MXe Server Configuration

Firewall/Port Forwarding

The Port Forward Table form allows external traffic to reach resources on the internal network and can contain up to 40 entries.

Table 70: Port Forward Table (CXi/CXi II/MXe/MXe Server only)

Parameter	Function/Values
Protocol	The WAN interface protocol; UDP or TCP.
Src Start Port	The source port at the start of the range.
Src End Port	The source port at the end of the range.
Dst IP Address	IP Address of the destination device.
Dst Start Port	Destination port at the start of the range.
Dst End Port	Destination port at the end of the range.

PPTP Remote Access

The PPTP form is used to program the internet gateway as a PPTP (Point to Point Tunneling Protocol) server for a remote client on the internet.

Table 71: PPTP (CXi/CXi II/MXe/MXe Server only)

Parameter	Function/Values
User Name	The username that the server uses to authenticate the remote client.
Password	Password that the server uses to authenticate the remote client.
Client IP Address	Address that the remote PPTP client uses on the LAN.
PPTP Access	Set to “Enable” to enable PPTP remote access.

WAN Settings (Internet Gateway)

The WAN Settings form is used to enable the WAN interface and provide internet connectivity settings.

- Enable WAN Access
- Select a WAN IP method: Static IP Address, DHCP Client, or PPPoE.

Tip: Refer to the Network Configuration chapters in the *3300 ICP Engineering Guidelines*.

Configuration A: CXi/CXi II/Typical Voice-Only Network

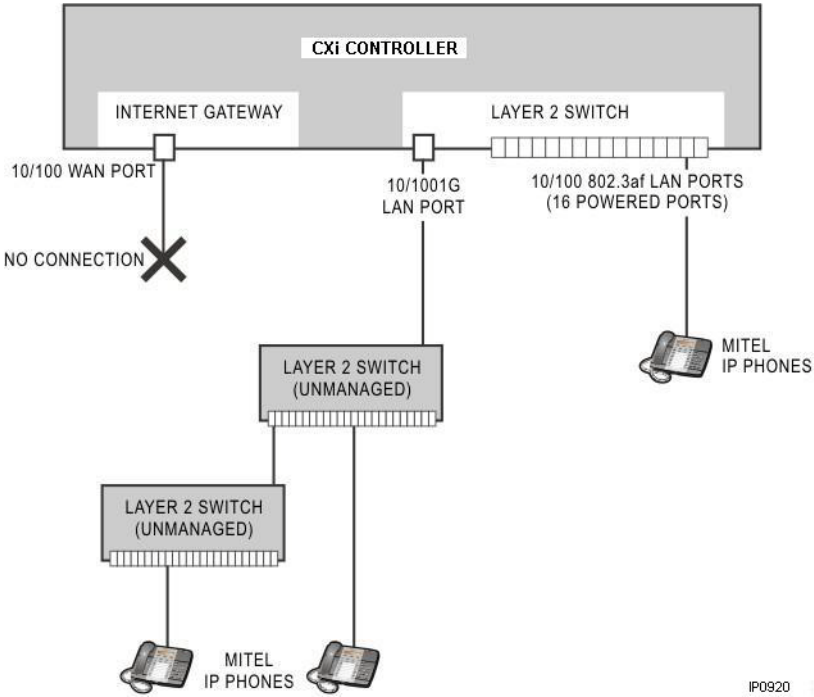


Figure 129: CXi/CXi II Voice-Only Configuration Example

IP Address	192.168.1.2
Subnet	255.255.255.0
Gateway	192.168.1.1
Layer 2	192.168.1.1

Configuration B: MXe Typical Voice-Only Network

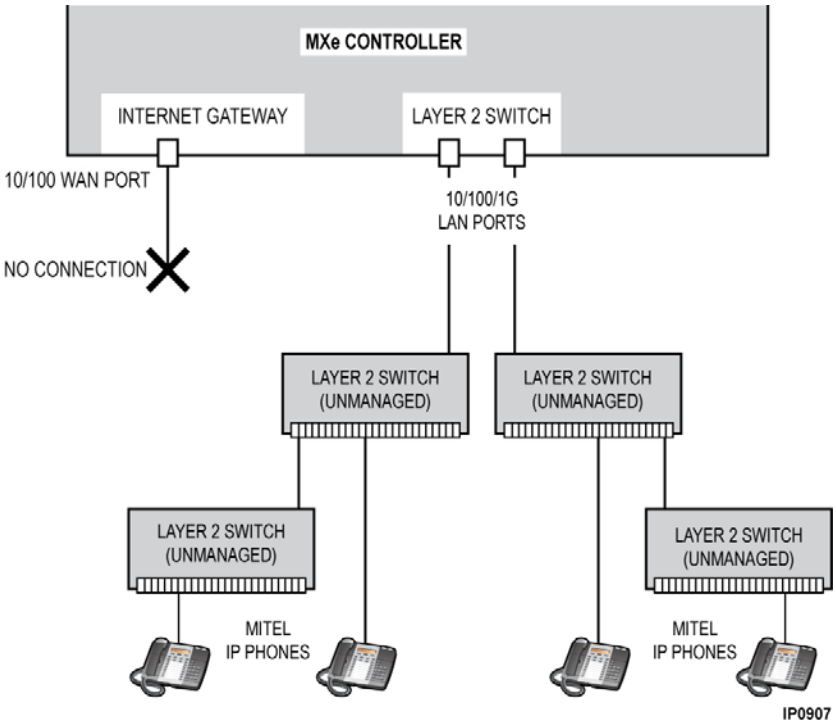


Figure 130: MXe Voice-Only Configuration Example

IP Address	192.168.1.2
Subnet	255.255.255.0
Gateway	192.168.1.1
Layer 2	192.168.1.1

Configuration C: CXi/CXi II Typical Voice and Data Network

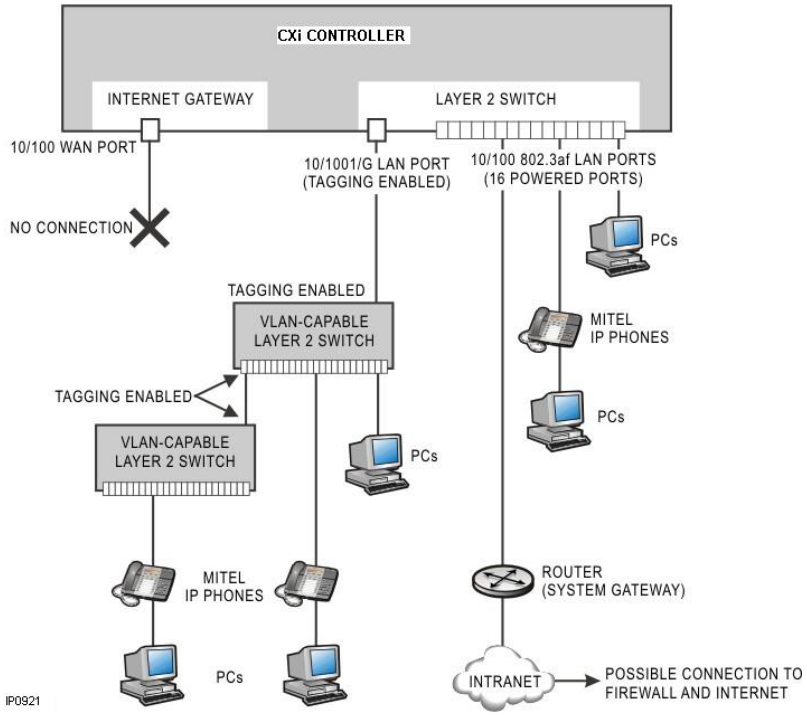


Figure 131: CXi/CXi II Voice and Data Configuration Example

IP Address	192.168.1.2
Subnet	255.255.255.0
Gateway (Router)	192.168.1.1
Layer 2	192.168.1.3

Tip: If an IP Address is on the IP Network List in the IP Routing form, the connection will be routed to 192.168.1.1 (router).
If the IP Address is not on the IP Network List, then the connection will be routed to the WAN Port automatically.

Configuration D: MXe Typical Voice and Data Network

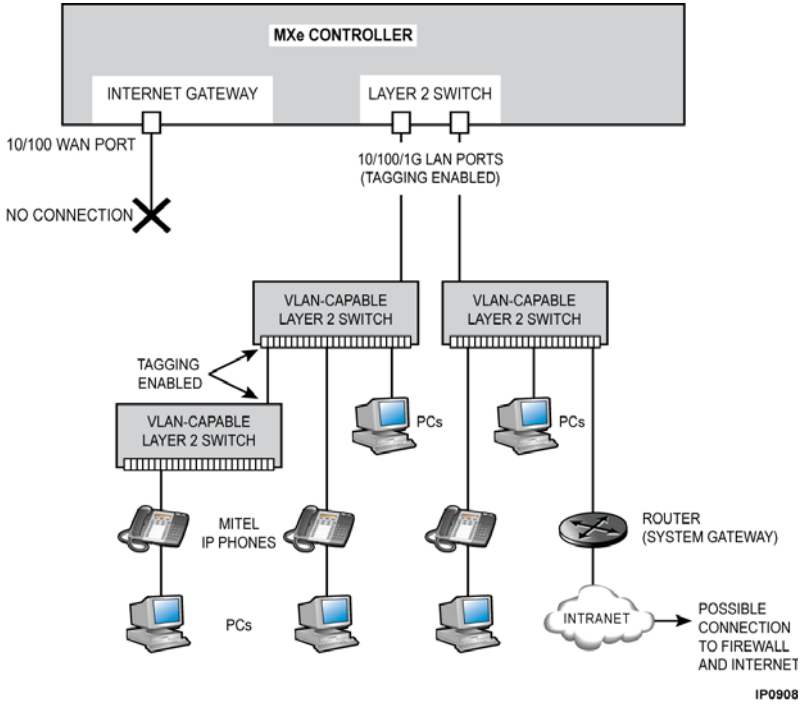


Figure 132: MXe Voice and Data Configuration Example

IP Address	192.168.1.2
Subnet	255.255.255.0
Gateway (Router)	192.168.1.1
Layer 2	192.168.1.3

Tip: If an IP Address is on the IP Network List in the IP Routing form, then the connection will be routed to 192.168.1.1 (router).
If the IP Address is not on the IP Network List, then the connection will be routed to the WAN Port automatically.

AX Configuration Procedures

AX Typical Voice-Only Network

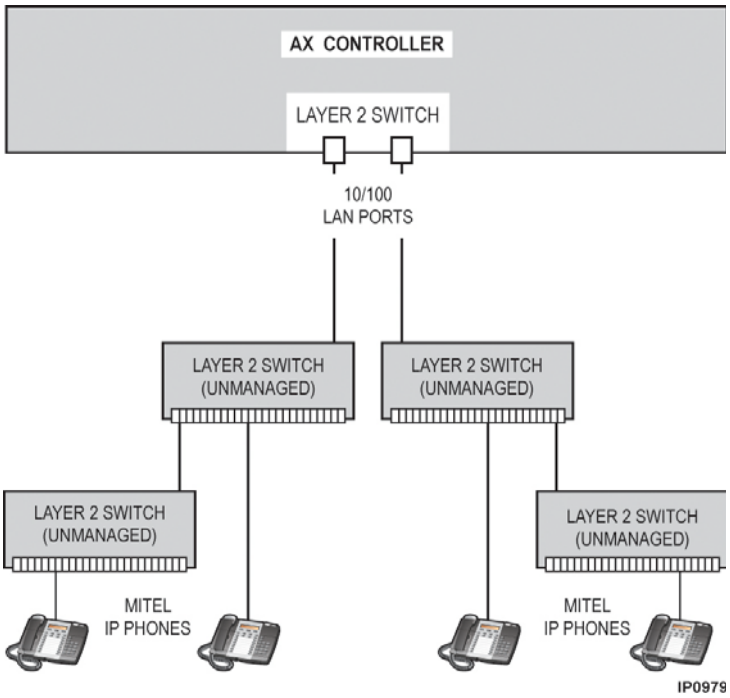


Figure 133: AX Voice-Only Configuration Example

IP Address	192.168.1.2
Subnet	255.255.255.0
Gateway	192.168.1.1

AX Typical Voice and Data Network

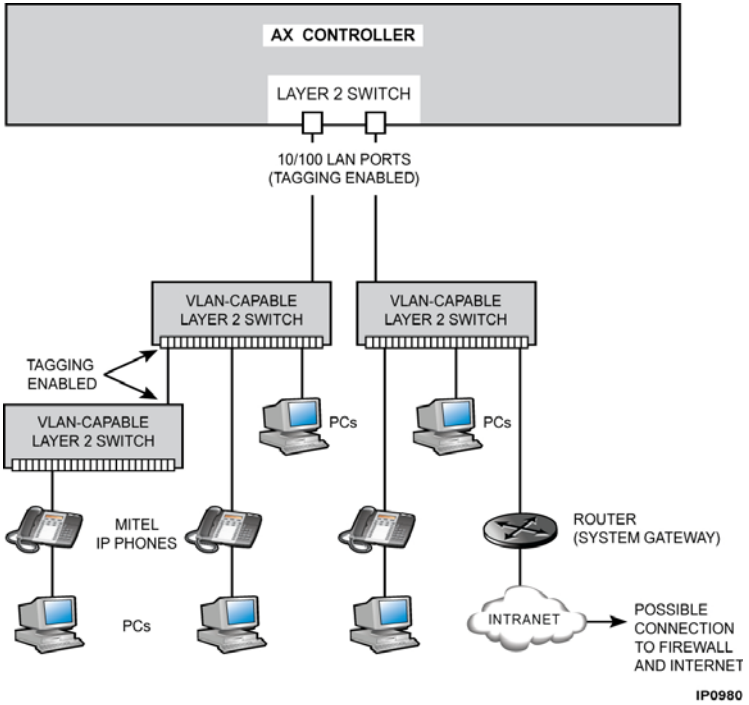


Figure 134: AX Voice and Data Configuration Example

IP Address	192.168.1.2
Subnet	255.255.255.0
Gateway (Router)	192.168.1.1

Tip: If an IP Address is on the IP Network List in the IP Routing form, then the connection will be routed to 192.168.1.1 (router).
If the IP Address is not on the IP Network List, then the connection will be routed to the WAN Port automatically.

CXi, CXi II, MXe and AX-Specific Guidelines

This section describes VLAN behavior, and the different types of network configurations: voice-only, voice and data, and the programming and configuration requirements for CXi, CXi II, MXe and AX.

The CXi, CXi II, MXe and AX controllers each include an internal L2 switch that is VLAN-capable. These controllers need to be treated as an integral part of the L2 networking infrastructure.

CXi, CXi II, MXe and AX VLAN Behavior

Note: For quick installation, the CXi, CXi II, MXe and AX can be installed using only the default VLAN (VLAN 1). VLAN1 carries both voice and data. If desired, the Administrator can program additional VLANs at a later date.

Default VLAN 1

When the CXi/CXi II/MXe/AX is on the default VLAN, it accepts untagged frames and tagged VLAN 1 frames. Any non-VLAN 1 tagged frames are dropped. The CXi/CXi II/MXe/AX treats untagged frames as VLAN 1 frames. The CXi/CXi II/MXe/AX prioritizes traffic based on the priority tag.

The CXi/CXi II/MXe have two priority queues, low (0-3) and high (4-7). The AX has four priority queues. By default untagged frames are placed in the low priority queue. Tagged frames are prioritized according to their priority tagging. On egress, all traffic on all ports is untagged with the exception of port 17 on the CXi/CXi II and the two LAN ports on the MXe, MXe Server and the AX, where the user has the option to tag VLAN1 traffic via the "Tag VLAN 1 on Trunk Port" parameter.

Voice VLAN

When the CXi/CXi II/MXe/AX is programmed with a Voice VLAN, the switch will allow untagged frames and tagged VLAN 1 frames as well as Voice VLAN frames. All other VLAN tagged frames will be dropped. The priority of tagged frames are preserved and queued accordingly. On egress, Voice VLAN traffic is either tagged on all ports (prior to Release 9.0) or configured as tagged or untagged on a port-by-port basis (Release 9.0 and later). Untagged frames are treated as VLAN 1 and forwarded to an external layer 2 switch.

CXi/CXi II: When the phones are on the Layer 2 switch of the CXi/CXi II, the phones and the CXi/CXi II switch must be on the same the Voice VLAN for the phones to communicate with the Call Control.

Data VLAN (CXi - Release 9.0 and later and CXi II)

The CXi/CXi II switch can be assigned a data VLAN to override the default VLAN 1. By default, all ports on the CXi/CXi II switch belong to VLAN 1.

In addition, VLAN membership can be assigned on a per port basis. Each port can be assigned as tagged or untagged on the data VLAN as well as the Voice VLAN. The default is tagged.

VLAN Routing

The installation remains the same as the CX, CX II, MX, and LX because the CXi, CXi II, MXe and AX rely on external routers to perform VLAN routing just as the CX, MX, and LX do.

An externally managed L2 switch connected to the AX/CXi/CXi II/MXe uplink port(s) must tag Voice VLAN traffic unlike the setup for the other controllers that do not have this requirement.

Figure 135 illustrates VLAN behavior by showing the CXi/CXi II integrated into a network carrying both voice and data.

In the figure, VLAN 1 is used for non-voice traffic and the Voice VLAN is used for voice traffic. A VLAN-capable, managed L2 switch is connected to the CXi/CXi II Gigabit Ethernet Uplink port for expansion purposes. An external DHCP server is set up to serve VLAN 1 and the CXi/CXi II internal DHCP server is used to serve the Voice VLAN. Figure 135 shows the usage of VLANs on the various network segments.

Note: You can configure the CXi/CXi II/MXe/AX internal DHCP server to provide DHCP services to both VLAN 1 and the Voice VLAN. In this case, an external DHCP server would not be required, but the external router in the corporate network would need to be configured to support routing from VLAN 1 to the Voice VLAN and DHCP forwarding would have to be enabled on the router.

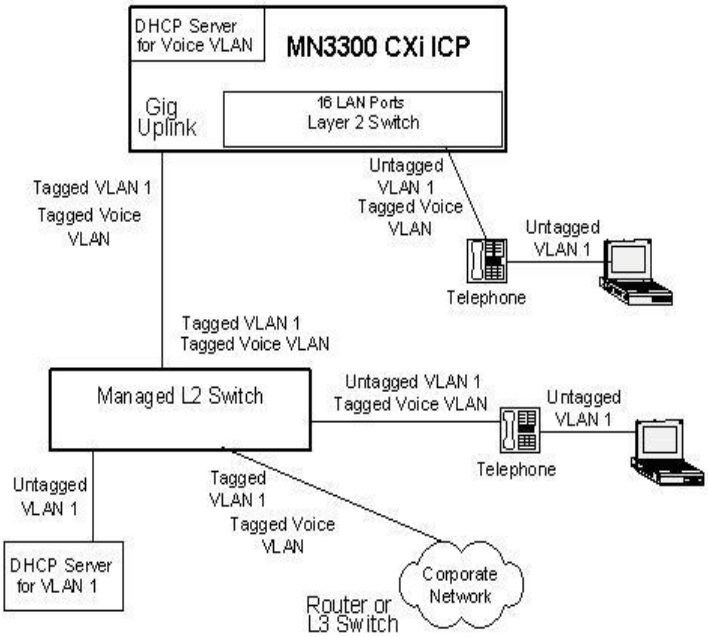


Figure 135: CXi/CXi II VLAN Behavior

Note: The default VLAN may not be 1, but it is untagged.

Implementing a Voice-Only Network

In a voice-only network, IP telephony devices are the only devices connected to the controller's network interfaces.

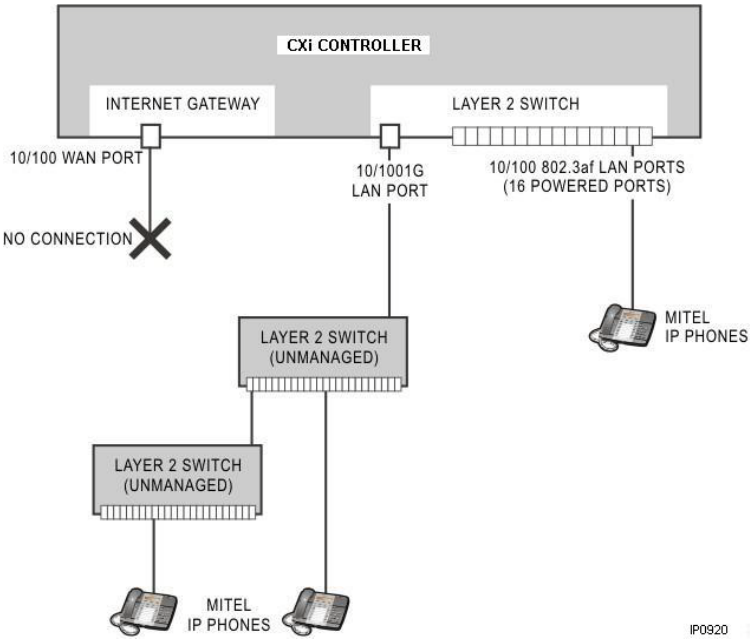


Figure 136: CXi/CXi II-based Typical Voice-Only Network

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MXe/AX/CXi/CXi II IP Settings

No changes to the controller's default IP settings are required for a voice-only network:

- CXi/CXi II - plug up to 16 IP phones into the internal Layer 2 switch ports (marked 10/100 802.3af) and plug up to 84 phones into the external L2 switches for a total of up to 100 IP phones.
- AX - connect up to 100 IP phones to the two 10/100 Mbps Ethernet ports.
- Base MXe - connect up to 350 IP phones to external switches. Split phones between the two 10/100/1G LAN ports.

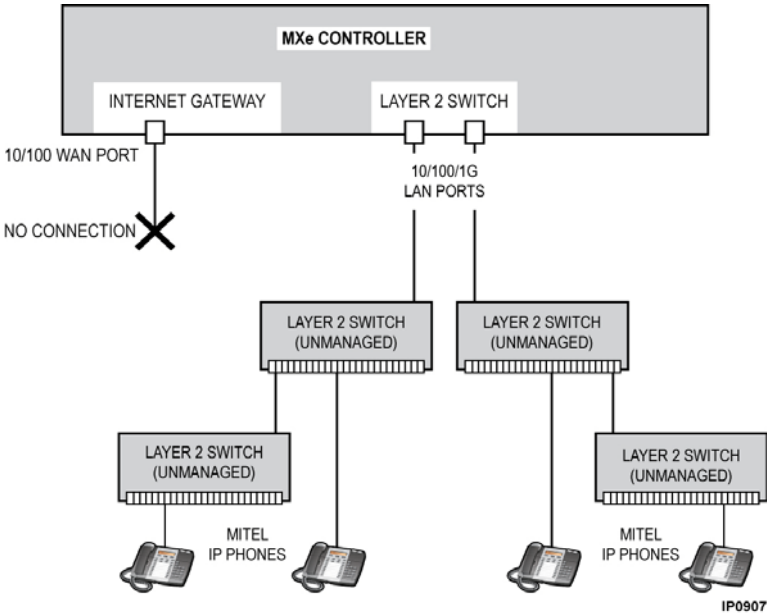

Figure 137: MXe-based Typical Voice-Only Network

Implementing a Voice and Data Network

Using a CXi/CXi II ICP

A voice and data network uses the CXi/CXi II controller's network interfaces to provide services for IP phones and PCs plus a firewall-protected connection to the Internet.

The 10/100/1G LAN port in the illustration is connected to a pair of Layer 2 switches. These two 24-port switches, daisy-chained together, provide an additional 48 ports. A single 48-port switch could also be used. Note that the maximum number of IP phones supported on the CXi is 100 and 150 on the CXi II.

PCs are shown connected to the network in two ways: directly to the Layer 2 switch and indirectly through a dual-port IP Phone.

CAUTION: To ensure optimum network performance, DO NOT connect servers to the 2nd port on IP phones.

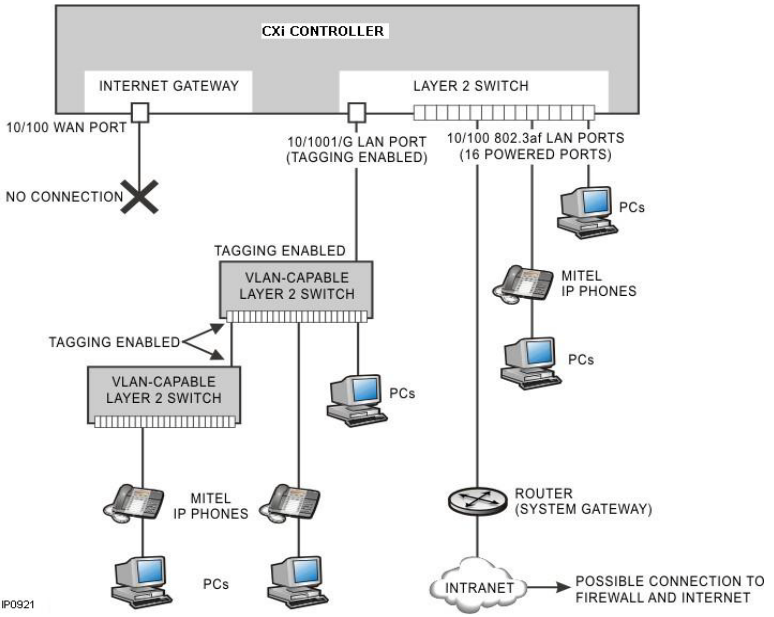

Figure 138: CXi/CXi II-based Typical Voice and Data Network

Using an MXe or AX ICP

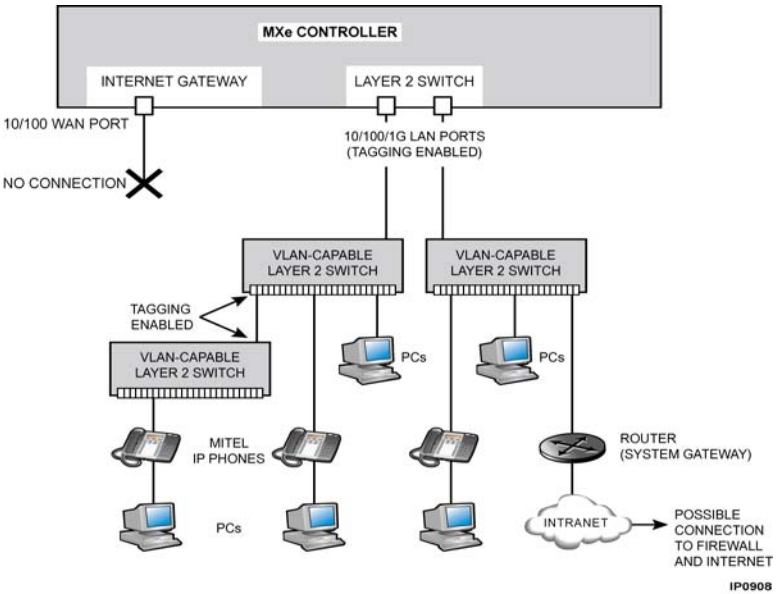

Figure 139: MXe-based Typical Voice and Data Network

Note: The AX controller does not have a built in Internet Gateway like the MXe does. The Internet Gateway features supported on the MXe, such as firewall, routing, NAT and remote routing, are not available on the AX controller.

Programming of VLANs on the AX differs from the CXi/CXi II and the MXe. On the AX, the 4 least significant bits must be unique for all VLANs.

This means that If VLAN 1 is already in use for the default data VLAN, then the voice VLAN cannot be VLAN 1, 17, 33, 49 or so on. If you try to program a non-valid VLAN, ESM will display a warning.

In the case where VLAN 1 is used for the data VLAN, the allowable VLAN values for voice exclude numbers where the least significant 4 bits are the same as VLAN 1. These values are 1 + n * 16, where n is 1 to 255.

DHCP Server: The default address information and options may need to be changed when installing the controller on a network with multiple subnets. If you are using an external DHCP server, disable the one in the controller. For programming instructions, refer to the System Administration Tool Online Help.

CXi/CXi II and MXe Configuration Requirements

Controller

- Internet Gateway (WAN port)
  - Use of the Internet Gateway is optional, but if you wish to use the Internet Gateway, you must specify the address assignment (PPPoE, DHCP client, static or Applications Processor Card), and program the firewall.
- Layer 2 switch
  - Depending on which IP addresses are already used in the network, you may have to change IP addresses to prevent IP conflicts. IP address changes may also be required to allow for traffic between the local and remote subnets, and to ensure quality of service for phone calls with VLAN prioritization.
- DHCP Server
  - The default address information and options may need to be changed when installing the controller on a network with multiple subnets. If you are using an external DHCP server, disable the one in the controller.

Tip: For programming instructions, refer to the System Administration Tool Online Help.

Other network devices

- External DHCP Server
  - If you are using an external DHCP server, make sure that it is programmed to provide addresses and options to all devices that require them.For details, refer to “To use an alternative DHCP server:” on page 78. Also, make sure to disable the DHCP server in the controller.
- External Layer 2 Switches
  - If a VLAN-capable switch is connected to the 10/100/1G port on the MXe, program its uplink port to send and receive tagged packets

on the default VLAN (1), and make sure that it treats packets with priority 6 as the highest priority. If another VLAN-capable switch is connected to the first, program it with the same settings.

- On the CXi/CXi II, enable VLAN tagging on the 10/100/1G (port 17)
- On the MXe enable VLAN tagging on both of the 10/100/1G ports.

VLAN tagging is accomplished with the same setting in the ESM Layer 2 (L2) Switch form, "Tag VLAN 1 on Trunk Ports". This setup allows the VLAN-capable switches to provide the same VLAN prioritization services as the internal Layer 2 switch on the CXi/CXi II, the MXe and the AX.

- Router
  - If a router is connected to the local internal network, designate it as the default gateway to the other networks. Program its IP address as the System Gateway IP on the CXi/CXi II and MXe. If an external router is present on the LAN, disable the Router Discovery Protocol on the CXi/CXi II and MXe.

Installing External Layer 2 Switches

Voice Only Networks

The CXi/CXi II provides 16 integrated Ethernet ports that can support up to 16 IP phones. To increase line size of the CXi to 100 lines (the system maximum for a CXi/CXi II), connect up to two layer 2 switches.

As a minimum, the L2 switches should support 10/100 BaseT. Because some programming may be necessary (e.g. port speeds), the L2 switches require a management interface.

Guidelines:

- When installing the CXi/CXi II, connect a single expansion Layer 2 switch to the 10/100/1G LAN port only. If using two 24-port switches, connect the second switch to the first in a daisy chain. Do not connect expansion switches to the 10/100 802.3af LAN ports on the CXi/CXi II.
- Mitel telephones require power, which they can receive from an adapter or power brick, or from a powered Ethernet connection. The 10/100 802.3af LAN ports of the CXi/CXi II provide Power over Ethernet (PoE), as do some expansion switches. The 10/ 100/1G LAN port on the CXi/CXi II does not provide PoE.

- The MXe and AX do not support PoE. The phones need to be powered from an adapter or power brick, or from a powered Ethernet connection. A variety of L2 switches provide PoE.
- Category 5 cable is required for the uplink connection between the expansion switches and the CXi/CXi II/MXe/AX, and is recommended for all other Ethernet connections. Category 3 cable can be used to connect single IP Phones directly to the expansion switches or to the Layer 2 switch of the CXi/CXi II.
- L2 switches for voice-only networks do not require VLAN capability.

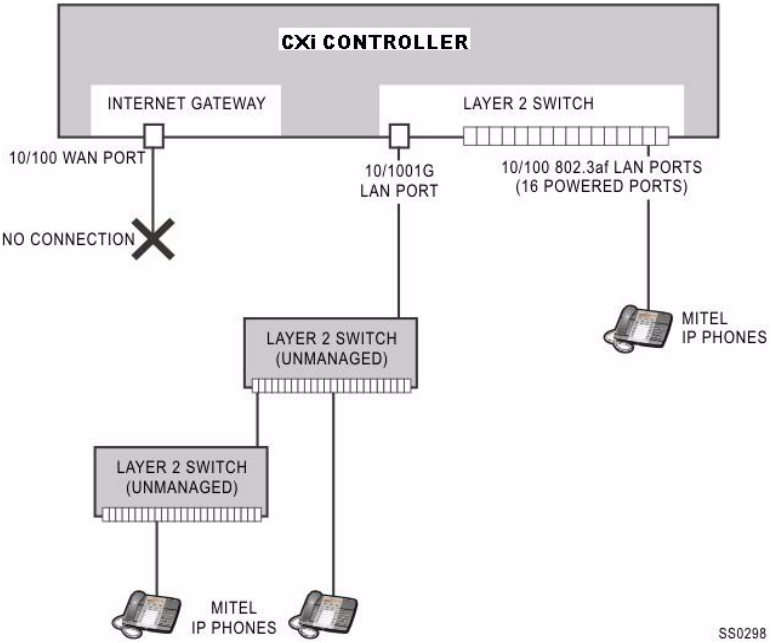

Figure 140: Expanded Voice only System

Voice and Data Networks

You can connect additional IP phones to the AX, MXe and CXi/CXi II controllers. Use one or two switches connected in a daisy chain. The L2 switches connect to the Ethernet ports or to the controller.

Note: The expansion switches must be manageable and must adhere to the 802.1p/Q VLAN standard.

Program the uplink port of the expansion switches to send and receive tagged packets on the default VLAN (1), and make sure that the expansion switches treat packets with priority value 6 as highest priority (this is the default setting on most switches).

Program the CXi/CXi II/MXe/AX to tag packets on their 10/100/1G LAN port(s).

Note: This assumes that the data VLAN is 1, and this is not always the case. You have to use untagged native to change this.

Guidelines

1. When connecting an expansion L2 switch to the CXi/CXi II, ensure that the switch is only connected to the 10/100/1G LAN port. If using two 24-port switches, connect the second switch to the first in a daisy chain.
2. When connecting expansion L2 switches to the CXi/CXi II, ensure that VLAN tagging is enabled on all trunk links that connect the expansion switches together. For two expansion switches, you need to enable VLAN tags for VLAN 1 on:
   - 10/100/1G LAN port of CXi/CXi II (port 17)
   - Switch port on first expansion switch; connects to port 17
   - Switch port on first expansion switch; connects to second switch
   - Switch port on first expansion switch; connects to first switch.
3. When connecting L2 switches to the MXe or AX, ensure that VLAN tagging is enabled on all trunk links that are used to connect L2 switches together. Enable VLAN tags for VLAN 1 on the LAN ports of the MXe/AX and the switch ports on the L2 switches that connect to the MXe/AX.
4. Connect the port(s) to the highest speed port on the first expansion switch, preferably a 1G port.
5. By default, all ports of the internal Layer 2 switch are on the default VLAN (1). This setting cannot be changed except on a CXi running Release 9.0 or later and on a CXi II.
6. Connect IP devices (PCs) to the voice and data network directly through a switch or indirectly through a dual-port IP phone. Servers must be connected to the network directly via a switch.
7. Dual-port phones use the same port speed as the connected PCs. For this reason, PCs with 100 Mbps Ethernet cards are recommended.

8. Mitel telephones can receive power from an adapter, a power brick or a powered Ethernet connection. The 10/100 802.3af LAN ports on the CXi/CXi II provide Power over Ethernet (PoE), as do some expansion switches. The 10/100/1G LAN port does not provide PoE and the MXe and AX do not provide PoE.
9. Category 5 or better cable is recommended for all Ethernet connections in a mixed voice and data environment.

Windows 2000 FTP Server

Figure 141, Figure 142 and Figure 143 below show examples of the settings needed on a Windows 2000 FTP server.

To program these FTP settings

1. Open the **Computer Management** control panel (**Start/Settings/Control Panels/Administrative Tools/Computer Management**).
2. In **Services and Applications**, click on **Internet Information**.
3. Program the settings as shown below (use the **IP Address** drop-down menu to select the PC's IP address).

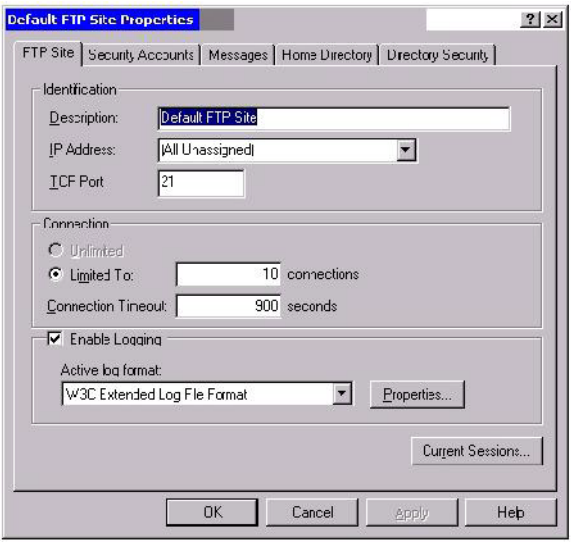

Figure 141: Windows 2000 FTP Site Tab

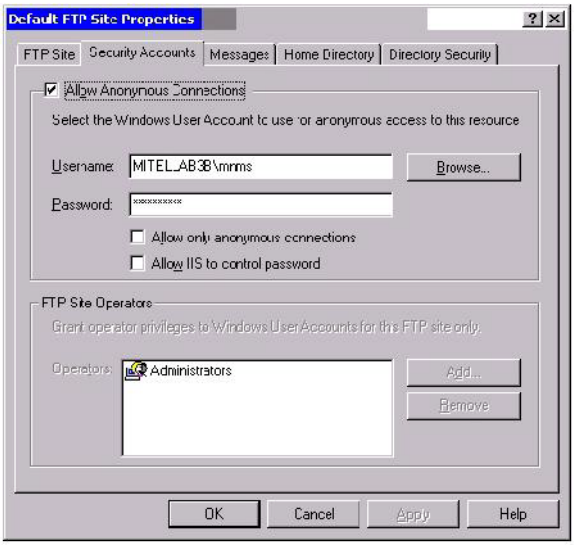

Figure 142: Windows 2000 Security Accounts Tab

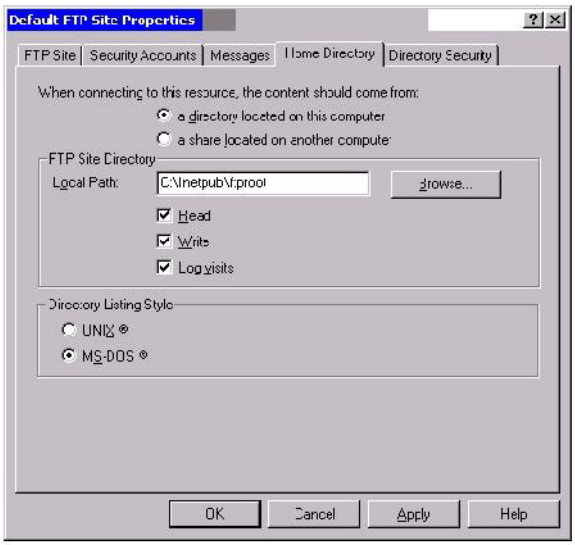

Figure 143: Windows 2000 Home Directory Tab

Appendix D

Status LEDs

This appendix describes the following LEDs in the 3300 ICP.

- Controller LEDs (page 338)
- Network Services Unit LEDs (page 356)
- Analog Services Unit LEDs (page 361)
- IP Phone and IP Appliance LAN LEDs (page 364)
- Peripheral Cabinet LEDs (page 365)
- Digital Services Unit LEDs (page 370)
- In-Line Power Unit LEDs (page 373)

For detail on any alarms, see the *3300 ICP Troubleshooting Guide*.

Controller LEDs

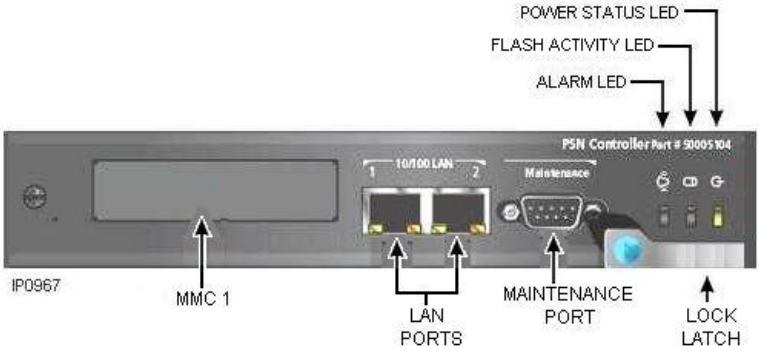

Figure 144: AX Controller Card LEDs

Power LED (page 342)
Flash Activity LED (page 342)
Alarm LED (page 342)
CIM LEDs (page 349)
T1/E1 Combo (page 353)
Dual T1/E1 Framer (page 352)
Quad BRI Framer (page 354)
Ethernet LEDs (page 347)

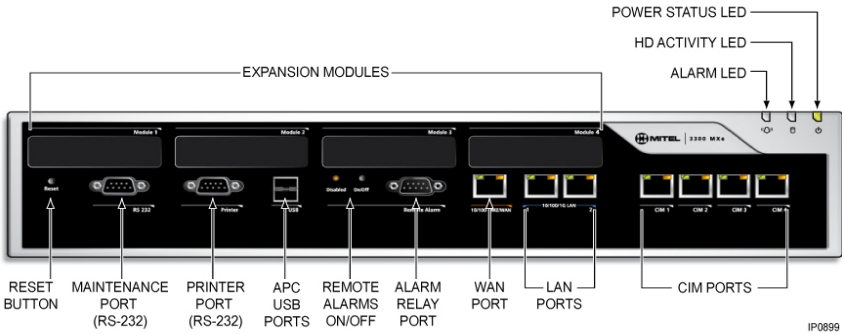

Figure 145: MXe/MXe Server – Front Panel

Power LED (page 342)
Hard Drive LED (page 342)
FIM LEDs (page 346)
Ethernet WAN/LEDs (page 347)
Alarm LED (page 342)
CIM LEDs (page 349)
T1/E1 Combo Card (page 354)
Dual T1/E1 Framer (page 352)
Quad BRI Framer (page 354)
Remote Alarms On/Off (page 350)

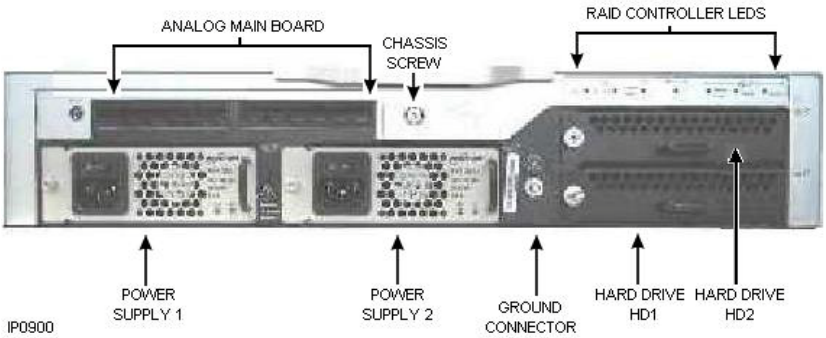

Figure 146: MXe Controller – Rear Panel with Analog

Power Supply LED (page 352) RAID Controller LEDs (page 343)

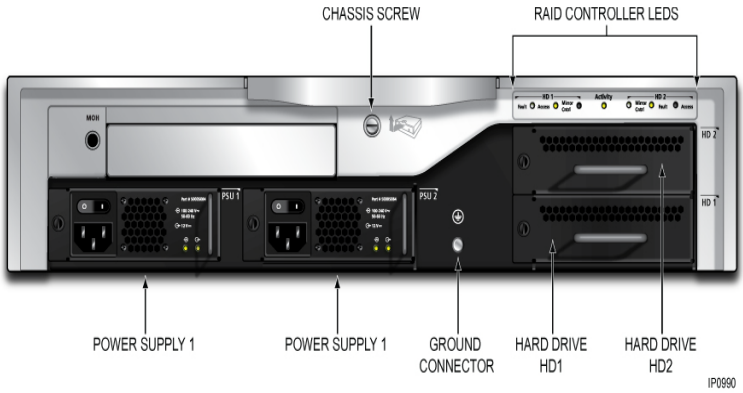

Figure 147: MXe Server – Rear Panel

Power Supply LED (page 352) RAID Controller LEDs (page 343)

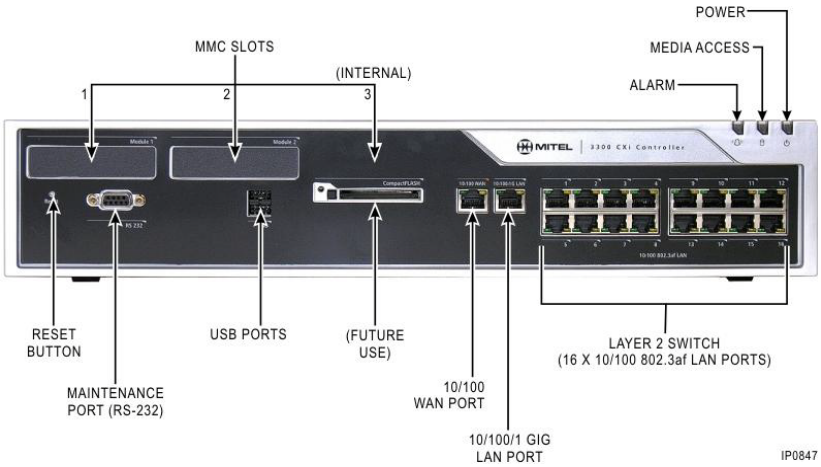

Figure 148: Controller LEDs (CX/CXi)

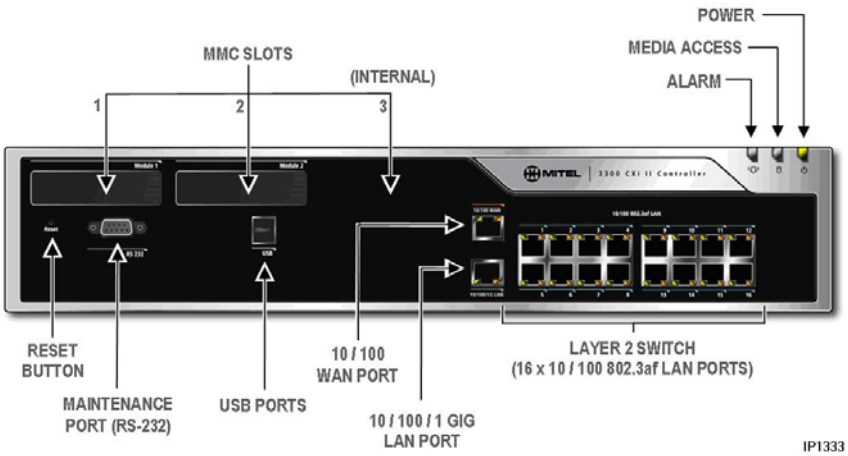

Figure 149: Controller LEDs (CX II/CXi II)

Power LED (page 342)
Hard Drive LED (page 342)
Alarm LED (page 350)
Ethernet LEDs (page 347)
T1/E1 Combo Card (page 354)
Quad BRI Framer (page 354)

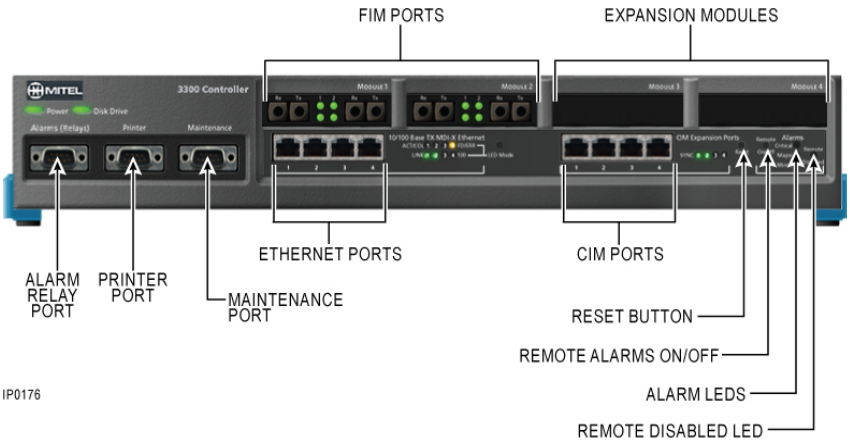

Figure 150: Controller LEDs (LX; MX; 100-User; 250/700-User)

Power LED (page 342)
Hard Drive LED (page 342)
FIM LEDs (page 346)
Ethernet LEDs (page 347)
CIM LEDs (page 349)
Alarm (Relay) LEDs (page 349)
Dual T1/E1 Framer (page 352)
Quad BRI Framer (page 354)
T1/E1 Combo (page 353)

Controller Alarm LEDs (AX, MXe/MXe Server)

Table 72: CX/CXi, CX II/CXi II, AX and MXe Controller Alarm LED

LED Status	Meaning
OFF	There is no system alarm.
Yellow flashing	Minor alarm.
Orange flashing	Major alarm.
Red flashing	Critical alarm.

Controller Power LED (AX, MXe/MXe Server, CX/CXi, CX II/CXi II, MX)

Table 73: Controller Power LED

LED Status	Meaning
Green on solid	The system booted successfully and is operating normally.
Red - two flashes	The unit is starting up properly (seen only during boot process). Not applicable to the CX II/CXi II. On the CX II/CXi II the LED is always GREEN during startup unless an error occurs. On an error the LED turns solid RED.
Red on solid	The unit has detected an error and is held in reset mode.
Red flashing	The unit has detected an error and will attempt a reset. Not a
OFF	The unit is not plugged in or is faulty. In the case of the AX, the LED is also off during boot-up.

Hard Drive or Flash Activity

Table 74: Hard Drive/Flash Activity LED (Media Access)

LED Status	Meaning
Off	The hard drive or flash is inactive.
On flashing	The internal hard disk or either of the flashes is being accessed.

RAID Controller

Refer to Knowledge Base Article 06-2806-00012 “RAID Controller Operations Manual” for RAID operation details.

MXe II

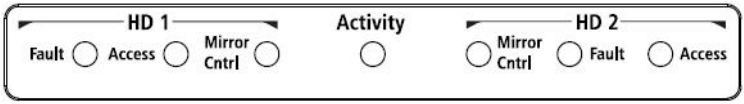

Figure 151: MXe II/MXe Server RAID Controller LEDs

Table 75: MXe II/MXe Server RAID Controller LEDs

Activity	Meaning
Green ON	No access
Orange ON	Read or write occurring on hard disk

Table 76: MXe II/MXe Server Mirror Cntrl Button Functions

Depress Button For	Access LED Flash Rate	Action Upon Release
0 - 5 seconds	Slow (1/sec)	Power down disk
6 - 10 seconds	Medium (2/sec)	Mirror rebuild
11 - 15 seconds	Fast (4/sec)	Reserved
16 - 20 seconds	Solid On	Reserved
> 20 seconds	Off	No Action
Note: To stop a button-action in progress, hold the mirror control button down for more than 20 seconds.		

Table 77: MXe II/MXe Server RAID Fault and Access LEDs

Hard Drive State	Fault	Access	Description
Normal	OFF	GREEN	Read or write
			Page 1 of 2

Table 77: MXe II/MXe Server RAID Fault and Access LEDs

Hard Drive State	Fault	Access	Description
Request off-line	OFF	GREEN flashing (1/sec)	Button pushed while online
Going off-line	OFF	GREEN	Button released, processing request
Off-line	OFF	OFF	
Request on-line	Note	GREEN flashing (1/sec)	
Coming on-line	OFF	OFF	Button released, processing
Drive removed	ORANGE	OFF	Replace drive and rebuild
Drive reinserted	ORANGE	OFF	Perform rebuild
Request rebuild	Note	GREEN flashing (2/sec)	
Rebuilding	GREEN flashing	GREEN	Button released, processing; may take 6 hours
Rebuild complete	OFF	GREEN	Resume normal operation
Soft fault	ORANGE flashing	GREEN	Read fault
Hard fault	ORANGE	OFF	Replace drive and rebuild
Note: Depends on previous LED state: OFF = Online; ORANGE = Fault.			
Page 2 of 2			

MXe III

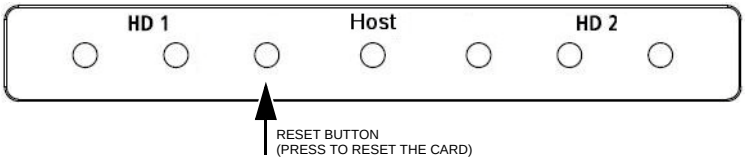

Figure 152: MXe III RAID Controller LEDs

Table 78: MXe III RAID Controller LEDs

Host	Meaning
OFF	• System off or reset • Hard disks disconnected
Green ON	Host idle
Flashing Green	Disks being accessed

Table 79: MXe III RAID Link LEDs

Hard Drive State	HD 1	HD 2	Description
Idle	BLUE	BLUE	Disk idle state
Normal	BLUE flashing	BLUE flashing	Disk read or write
Off-line	OFF	OFF	No power, cable disconnected, or hard drives absent
No host	ON	OFF	HD 2 absent
	OFF	ON	HD 1 absent
Rebuilding	Fast BLUE flashing	Slow BLUE flashing	HD 2 being updated
	Slow BLUE flashing	Fast BLUE flashing	HD 1 being updated

Page 1 of 2

Table 79: MXe III RAID Link LEDs (continued)

Hard Drive State	HD 1	HD 2	Description
Failure	BLUE	Slow BLUE flashing	HD 2 failed or out of date
	Slow BLUE flashing	BLUE	HD 1 failed or out of date
Mismatch	BLUE	BLUE flashing SOS signal (Three quick flashes followed by three slow flashes)	HD 2 was swapped but does not match
	BLUE flashing SOS signal	BLUE	HD 1 was swapped but does not match
			Page 2 of 2

FIM

The top LED indicates the status of local FIM. The bottom LED indicates the status of the remote FIM.

The controller FIM monitors the synchronization of the clock appearing on the fiber link from the peripheral cabinet or DSU. The FIM in the peripheral cabinet or DSU monitors the synchronization of the clock appearing on the fiber link from the controller.

Table 80: Controller FIM LEDs (LX; MX; MXe; 100-User; 250/700-User)

LED Status	Meaning (Both LEDs)
ON	In-frame synchronization.
Flashing	Out of synchronization *OR* Tx and Rx fiber optic cables reversed.
OFF	Power off *OR* held in reset.

LAN Ethernet Ports

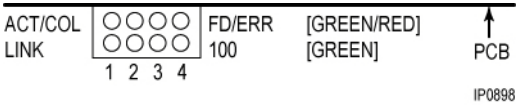

Figure 153: Controller LAN Ethernet Port LEDs (LX; 100/250/700-User)

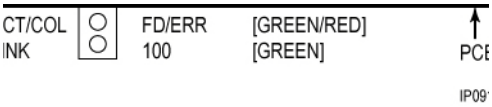

Figure 154: Controller LAN Ethernet Port LEDs (MX)

Table 81: Controller Ethernet Port LEDs (LX; MX; 100-User; 250/700-User)

LED		Meaning	
Top	**Bottom**	**Normal Mode**	**Switch Pressed Mode**
ON (Green)	—	Link activity	Full duplex
ON (Red)	—	Collision	ERR
—	ON (Green)	Link integrity	100 Mbps
—	OFF	No link integrity	10 Mbps

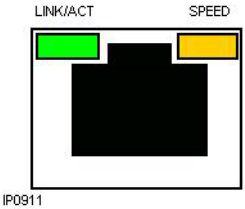

Figure 155: Controller LAN Ethernet Port LEDs (AX, CX/CXi, CX II/CXi II/MXe/MXe Server)

Table 82: WAN/LAN Port LEDs (CX/CXi, CX II/CXi II/ MXe/MXe Server, AX)

LED	Meaning
Green on	Link is active.
Green blinking	Link is active and transmitting or receiving.
Green off	Link is inactive.
Yellow on	Data transmission/reception is at 100 Mbps (the port speed for the 10/100/1GigE LAN Port can be up to 1 Gbps).
Yellow off	Data transmission/reception is at 10 Mbps.
Note: The AX controller does not support a WAN interface.	

CIM, Embedded and Quad MMC

Table 83: Controller CIM LEDs

LED Status	Meaning (Both LEDs)
ON	In-frame synchronization.
Flashing	Out of synchronization *OR* Tx and Rx copper cables reversed.
OFF	Power off *OR* held in reset.

Controller Alarm

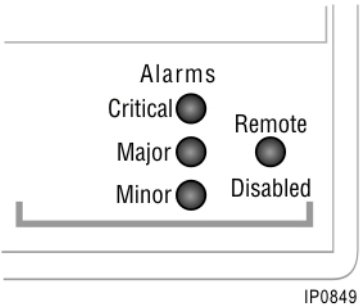

Figure 156: Controller Alarm (Relay) LEDs (LX; MX; 100-User; 250/700-User)

Note: The MXe also has a Remote Disabled LED.

Table 84 below shows the meaning of the Alarm LEDs.

Table 84: Controller Alarm (Relay) LEDs (LX, MX; 100-User, 250/700-User)

Alarm	State	Meaning
Critical	Red on	Service is lost; immediate maintenance required (critical alarm invokes system fail transfer if enabled). *OR* Power on reset ongoing. *OR* INIT switch activated (resets all boards).
	off	No alarm.
		Page 1 of 2

Table 84: Controller Alarm (Relay) LEDs (LX, MX; 100-User, 250/700-User) (continued)

Alarm	State	Meaning
Major	Red on	Service has degraded beyond predetermined threshold. OR Embedded voice mail is not functioning or disk space used is at 98%.
	off	No alarm.
Minor	Red on	Minor malfunction in system (minor alarm raised when system not fully operational). OR Embedded voice mail disk space used is at 90%.
	off	No alarm.
Remote Disabled	Red on	Alarm is on, but silenced (Silence state is toggled by the Remove Alarms ON/OFF switch). *OR* PRO or INIT switch active.
	off	Alarm is audible *OR* Controller is powering up.
		Page 2 of 2

Table 85 below shows the meaning of the alarm LEDs.

Table 85: Controller Alarm LEDs (CX/CXi, CX II/CXi II/ MXe/MXe Server, AX)

Alarm		LED State	Meaning
AX	CX/CXi, CX II/CXi II/MXe/ MXe Server		
Critical	Critical	Red flashing	Service is lost; immediate maintenance required (system fail transfer invoked if enabled) OR Power on reset ongoing.
			Page 1 of 2

Table 85: Controller Alarm LEDs (CX/CXi, CX II/CXi II/ MXe/MXe Server, AX)

Alarm		LED State	Meaning
AX	CX/CXi, CX II/CXi II/MXe/ MXe Server		
Major	Major	Orange flashing	Service has degraded beyond predetermined threshold. OR Embedded voice mail is not functioning or disk space is at 98%.
Minor	Minor	Yellow flashing	Minor malfunction in system (minor alarm raised when system not fully operational). OR Embedded voice mail disk space is at 90%.
n/a	Reset button depressed	Red/ Orange/ Yellow	Alarm is on, but silenced (Silence state is toggled by the Remote Alarms ON/OFF switch). OR PRO or INIT switch active.
		OFF	Normal operation.
	Remote Disabled (MXe/ MXe Server only)	Red on	Alarm is on, but silenced (Silence state is toggled by the Remove Alarms ON/OFF switch). OR PRO or INIT switch active.
		off	Alarm is audible OR Controller is powering up.
Page 2 of 2			

Power Supply Unit LEDs

LED	Status	Meaning
Input OK	Green ON	Input is within parameters.
	OFF	Power supply is OFF
Output OK	Green ON	Output voltage is within normal operating range.

Dual T1/E1 Framer Module

Figure 157: Dual T1/E1 Framer Module

Table 86: Controller Dual T1/E1 Framer LEDs

LED		Meaning
Alarm (bottom)	Status (top)	
ON (Red)	—	No Layer 1.
ON (Yellow)	—	Alarm indication from far end.
OFF	—	No error
—	ON (Green)	ISDN D-Channel established.
—	Flashing (Green)	Layer 1 established. (ISDN only)
—	OFF	No link.
On (Yellow) with right side OFF	ON (Green)	Blue alarm from far end.
OFF	OFF	Not programmed.

T1/E1 Combo Card

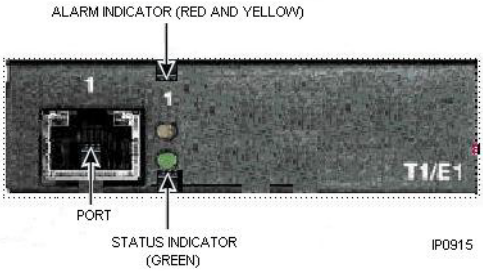

Figure 158: Controller T1/E1 Combo Card (Rel 6.0)

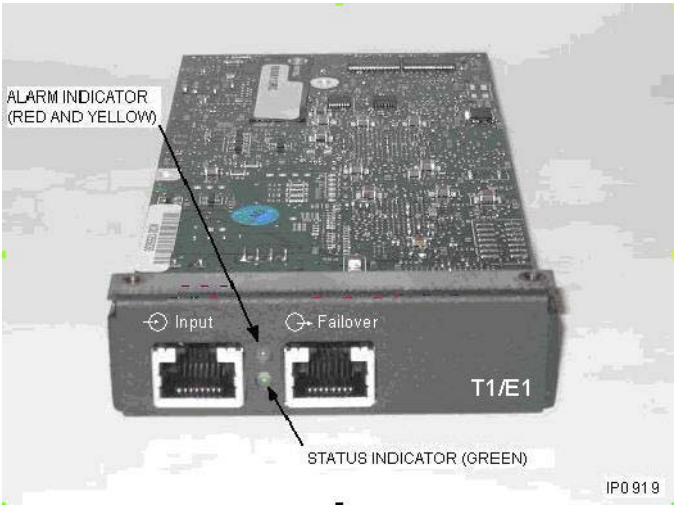

Figure 159: Resilient T1/E1 Combo Card (Rel 7.0)

Table 87: Controller T1/E1 Combo Card

Status LED (green)	Alarm LED (red/yellow)	Meaning
Off	Off	Link not programmed or link descriptor not assigned.
Off	Solid Red	Red alarm. Loss of signal; check link connection.
Off	Solid Yellow	Yellow alarm. No signal from remote end; check link with analyzer. (This state is normal during startup.)
Solid Green	Solid Yellow	Blue alarm. Check link with analyzer.
Solid Green	Off	Layer 1 synchronized. Good link state; no alarms.
Flashing Green	Solid Yellow	Alarm indication from remote end.
Flashing Green	Flashing Red	The card is in resilient mode.

Quad BRI Framer Module

For each BRI port on the Quad BRI MMC, there are two LEDs - red on the upper left and green on the upper right. These LEDs represent the status of the BRI ports as described in Table 88.

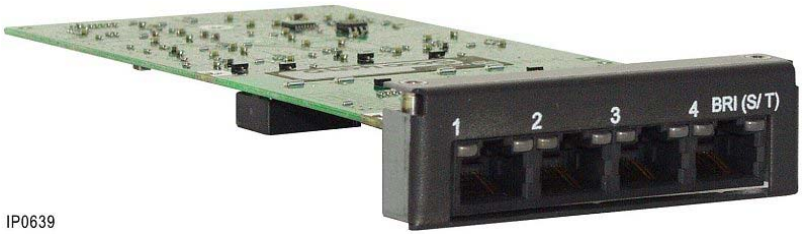

Figure 160: Controller BRI Framer LEDs

Table 88: Controller BRI Framer LEDs

LED		Meaning
Alarm	**Status**	
Red Green	OFF OFF	BRI port not programmed. Link Descriptor is not assigned in the Digital Links form.
Red Green	ON OFF	BRI port programmed but not active. BRI cable not plugged in, or wrong cable type (1:1 or crossover). BRI link may not be active (or layer 1 power save is active). No alarms are returned to the 3300 and circuits are idle. To prevent routing problems when there is a faulty BRI port, program the MSDN/DPNSS Stepback feature. Refer to the System Administration Tool online Help for details.
Red Green	OFF ON	BRI port programmed and active. Does not mean that the D-channel is active. BRI can negotiate this on a per-call basis.

Network Services Unit LEDs

Universal/R2 NSU

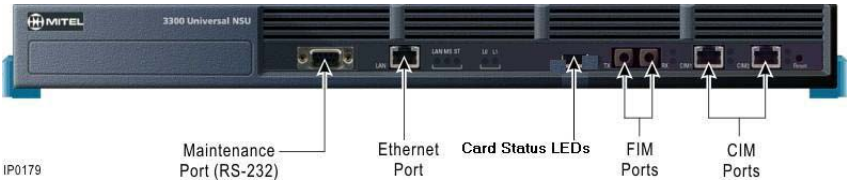

Figure 161: Universal and R2 NSU LEDs

NSU FIM LEDs

Table 89: NSU FIM LEDs

LED Status	Meaning for local (upper) and remote (lower) FIM
ON	In-frame synchronization.
Flashing	Out of synchronization *OR* Tx and Rx fibers reversed.
OFF	Power off *OR* held in reset.
Note: When a Remote FIM LED is OFF, check the Local FIM LED; if the Local FIM LED is ON, a fiber optic cable may be faulty.	

NSU CIM LEDs

Table 90: NSU CIM LEDs

LED Status	Meaning (all LEDs)
OFF	No Power.
Flashing	Powered on.
ON	Communication Link synchronized with other node.

Universal NSU LED States

Table 91: Universal NSU LED States

LED	State	Meaning
LAN	flashing	LAN activity
MS (message system)	solid green	Message link open to the system
	OFF	Message link not open to the system; may be downloading when L0 and L1 are “walking”
ST (status)	flashing	Operational; flashing at 0.5 sec intervals
	OFF	Not operational
	solid	Card is booting or not operating; should be blinking at 0.5 sec intervals
L0 and L1 (on front and rear)	right side - solid red	No Layer 1
	right side - OFF	No error
	left side - solid green	D-channel established (PRI) Layer 1 established (T1, E1, DPNSS)
	left side - flashing green	Layer 1 established (PRI)
	left side - OFF	No link
	right side - yellow with left side - flashing green	Alarm indication from far end
	right side - yellow with left side - OFF	Blue alarm from card - normal during link startup (PRI NA or response to yellow)
	yellow and green alternating between L0 and L1	Downloading (15 - 25 minutes)
	yellow alternating between L0 and L1	Decompressing and copying files (2 - 4 minutes)
Note: When the LEDs are alternating, NSU is powering up. Do NOT interrupt or you might corrupt the card software.		

NSU Card Status

Table 92: Message Link Controlled (Card Status)

LED			Meaning
Green	Yellow	Red	
ON	—	—	No error.
—	ON	—	Out of service.
—	—	ON	Error (not necessarily total failure).
ON	ON	—	Out of service (may occur at power up).
ON	—	ON	Fault detected.
—	ON	ON	Out of service (appears at power up).
ON	ON	ON	Appears at power up before the NSU is fully operational.
OFF	OFF	OFF	Fully operational.

R2 NSU LED States

Table 93: R2 NSU LED States

LED	State	Meaning
LAN	flashing	LAN activity
MS (message system)	solid green	Message link open to the system
	OFF	Message link not open to the system
ST (status)	flashing	Operational
	OFF	Not operational
	solid	Card is booting

Page 1 of 2

Table 93: R2 NSU LED States (continued)

LED	State	Meaning
L0 and L1 (on front and rear)	right side - solid red	Error (no physical layer is present or network/line side jumper is not set correctly)
	right side - OFF	No error
	left side - solid green	AB signaling established
	left side - flashing green	Layer 1 established
	left side - OFF	No link
	right side - yellow with left side - flashing green	Alarm indication from far end
	right side - yellow with left side - OFF	Blue alarm from card - normal during link startup
	yellow and green alternating between L0 / L1	Downloading (15 - 25 minutes)
	yellow alternating between L0 and L1	Decompressing and copying files (2 - 4 minutes)
Note: When the LEDs are alternating, NSU is powering up. Do NOT interrupt or you might corrupt the card software.		
		Page 2 of 2

BRI NSU

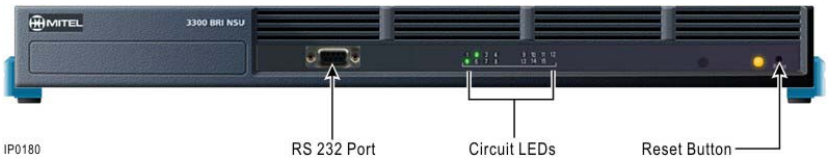

Figure 162: BRI NSU LEDs

BRI NSU LED States

Fifteen circuit LEDs and one status LED are mounted on the faceplate. The status LED shows the status of the CEPT link, and each of the circuit LEDs shows the status of one BRI circuit. The BRI circuit LEDs are also used during card initialization to indicate the progress of the self-test and to indicate that the download is in progress.

Table 94: BRI NSU CEPT LED States

LED Status	Meaning
ON	Call in progress on DPNSS link.
Flashing	1 second cycle: Layer 1 established. 4 seconds cycle: Layer 2 established.
OFF	CEPT link not established.

Analog Services Unit LEDs

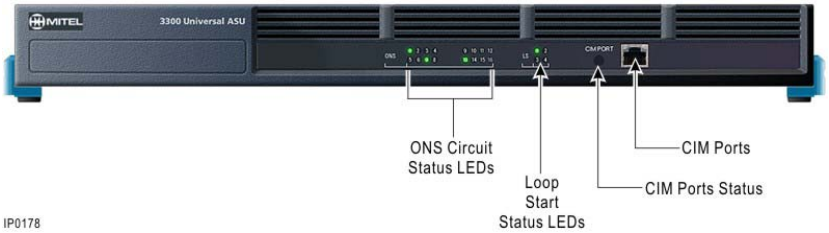

Figure 163: Universal ASU LEDs

The Universal ASU has 16 ONS LEDs, 4LS LEDs, and a CIM Status LED.

Figure 164: ASU LEDs

The ASU has 24 ONS LEDs, and a CIM Status LED.

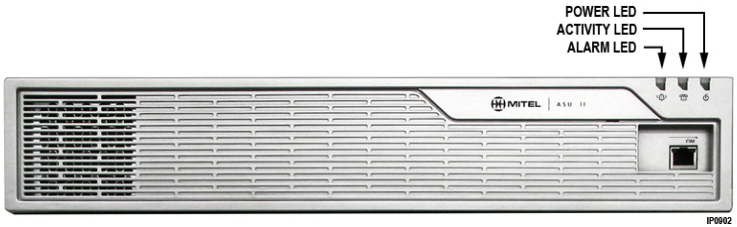

Figure 165: ASU II LEDs

The ASU II has an Alarm, Activity, and Power LED.

Tip: There are no LEDs specific to the embedded analog in an MX controller. Refer to “Controller LEDs” on page 338 for LED descriptions.

Universal ASU, ASU, and ASU II CIM Status LEDs

Table 95: CIM LED

LED Status - RED	Meaning
ON	Communication link synchronized with Controller.
Flashing	Powered on, BSP running.
OFF	No power.

Universal ASU LS Circuit LEDs

Table 96: Universal ASU and ASU ONS/LS Circuit LEDs

LED Status	Circuit State	Circuit Status
Steady ON	Off hook.	n/a
Slow Flash	Idle	Circuit is manual busy.
Fast Flash	Idle	Circuit fault.
OFF	Idle	n/a

Analog Services Unit II Alarm LED

Table 97: ASU II Alarm LED (Red)

LED Status	Meaning
Flashing or ON	System error.
OFF	No error.

Analog Services Unit II Activity LED

Table 98: ASU II Activity LED (Green)

LED Status	Meaning
ON	Fully operational.
Flashing	Initial boot-up.
OFF	No power.

ASU II Card LEDs

ASU II ONS and Combo Card Alarm LED

Table 99: ASU II Card Alarm LED

LED Status	Meaning
Red ON	System error.
Red OFF	No error.

ASU II ONS Card Activity LED

Table 100: ASU II ONS Card Activity LED

LED Status	Meaning
Green ON	System error.
Green OFF	No error.

ASU II Combo Card Activity LED

Table 101: ASU II Combo Card Activity LED

LED Status	Meaning
Red ON	Out of service and power applied. An SFT call can be made.
Green OFF	No error.
Red OFF	No error.
Green ON	There is an established SFT or normal call.

IP Device LEDs

The IP Phones and IP Appliances have LAN Line Status LEDs on the back of the device. The network connection (LAN) LEDs are on the back of the phone near the LAN and PC ports. The Dual Mode IP Phones do not have LAN LEDs.

Table 102 shows the meaning of the IP Phone, IP Appliance LAN LEDs.

Table 102: IP Phone, IP Appliance LAN LEDs

LED Status	Meaning
Solid Green	Valid network connection
Green Off	Physical connection problem
Flashing Red	Indicates activity (data flow) on the network
Red Off	Possible network server problem

Peripheral Cabinet LEDs

Peripheral Cabinet FIM

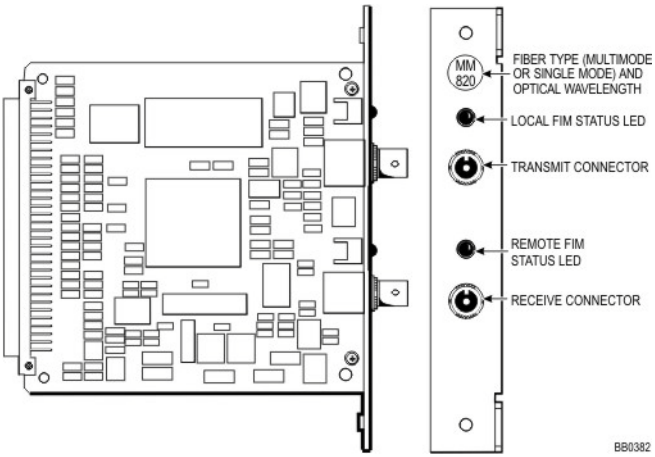

Figure 166: Peripheral Cabinet FIM LEDs

Table 103: Peripheral Cabinet LEDs

LED Status	Meaning (All LEDs)
ON	In-frame synchronization
Flashing	Out of synchronization *OR* TX and RX fiber optic cables reversed.
OFF	Power off *OR* held in reset

Table 104: Peripheral Card LEDs

LED Status	Meaning (All LEDs)
Card Status LEDs	
Yellow ON	Card is out of service (not programmed).
Yellow OFF	Card is in service.
	Page 1 of 2

Table 104: Peripheral Card LEDs (continued)

LED Status	Meaning (All LEDs)
Red ON	Card has a fault in some or all of its circuits or it is in manbusy state.
Red OFF	Card is in service.
Circuit Status LEDs	
ON	Circuit busy or booting.
Flashing	Circuit fault.
OFF	Circuit idle.
	Page 2 of 2

SX-200 Bay LEDs

BCC III

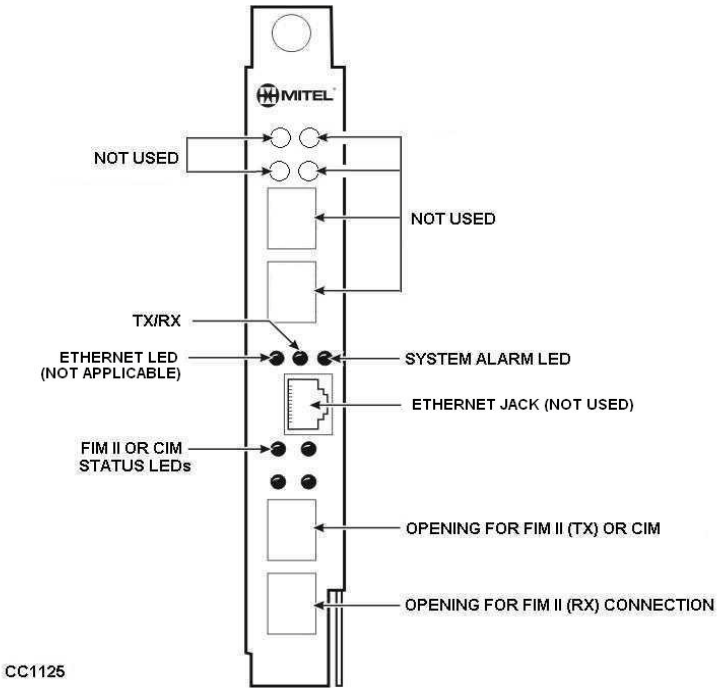

Figure 167: Peripheral Cabinet FIM LEDs

Table 105: BCC III LEDs

TX/RX LED	Ethernet LED	Alarm LED	Meaning
ON	Not applicable See Note.	ON	BCC III is starting up (booting). **Note:** It takes more than 70 seconds before the BCC III begins communicating with the 3300 ICP. Just before the BCC III starts to communicate with the 3300 ICP, the TX/RX LED goes out and then the alarm LED goes out. If there isn't any communication, the TX/RX LED turns on again. **Note:** The Ethernet LED and the Ethernet jack is not used by the technician in the field; only manufacturing use these.
OFF	Not applicable	ON	BCC III is attempting to start communication with the 3300 ICP.
Flashing	Not applicable	ON	BCC III is being downloaded by the 3300 ICP. The download process takes approximately 10 minutes.
Flashing	Not applicable	Flashing	TX/RX and ALARM alternate being on. BCC III is updating its software. **DO NOT POWER OFF**.
Flashing	Not applicable	OFF	BCC III is up and communicating with the 3300 ICP.
OFF	Not applicable	Flashing	Failure on 3300 ICP.
Note: The Ethernet port is not used.			

Table 106: FIM or LEDs

LED Status	Meaning (All LEDs)
ON	In-frame synchronization
Flashing	Out of synchronization *OR* TX and RX fiber optic cables reversed.
OFF	Power off *OR* held in reset

Table 107: Peripheral Card LEDs

LED Status	Meaning (All LEDs)
Card Alarm Status LEDs	
ON	Wrong card is plugged into the slot or plugged into a slot that is unassigned (not programmed).
OFF	Card is in service.
Circuit Status LEDs	
ON	Circuit busy or booting.
Flashing	Circuit fault.
OFF	Circuit idle.

Digital Services Unit LEDs

BRI Card

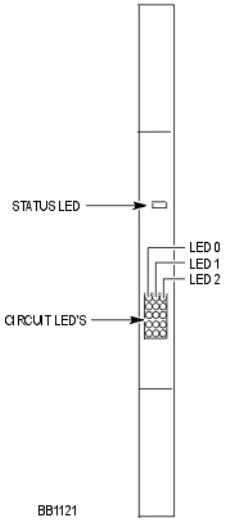

Figure 168: DSU BRI Card LEDs

One status LED and fifteen circuit LEDs are mounted on the BRI card faceplate. The status LED shows the status of the CEPT link, and each of the circuit LEDs shows the status of one BRI circuit. The BRI circuit LEDs are also used during card initialization to indicate the progress of the self-test and to indicate that the download is in progress (see Table 108).

Table 108: BRI Card Circuit LEDs

LED	State	Meaning (All LEDs)
CEPT		
Status	Off	CEPT link not established
	Flashing at 1 Hz	Layer 1 established
	Flashing at 4 Hz	Layer 2 established
	On	Call in progress on the DPNSS link
		Page 1 of 2

Table 108: BRI Card Circuit LEDs (continued)

LED	State	Meaning (All LEDs)
BRI		
Circuit	Off	BRI circuit not in use (no device connected to circuit)
	Flashing at 1 Hz	Idle device connected to the circuit (layer 1 established)
	Flashing at 4 Hz	Call being established from device on circuit (layer 2 established)
	On	Call in progress at device on circuit (layer 3 established)

Page 2 of 2

DSU PRI and R2 Card LEDs

Three status LEDs and 14 circuit LEDs are mounted on the DSU card faceplate. Each of the card circuit LEDs shows the status of one circuit.

Table 109: DSU Card Circuit LEDs

LED	State	Meaning	
		DSU PRI	DSU R2
L0 and L1	right side - solid red	error	error (no physical layer is present or network/line side (NT/LT) jumper is not set correctly)
	right side - off	no error	
	left side - solid green	D-channel established	AB signaling established
	left side - flashing green	Layer 1 established	
	left side - off	no link	
	right side - yellow with left side - flashing green	alarm indication from far end	
	right side - yellow with left side - off	blue alarm from card - normal during link startup	
ST (status)	flashing	operational	
	off	not operational	
	solid	card is booting	
MS (message system)	solid green	message link open to the system	
	off	message link not open to the system	

In-Line Power Unit LEDs

Figure 169: In-Line Power Unit LEDs

The In-Line Power Unit LEDs are grouped as follows:

- AC Power (below)
- Power Unit Alarm (page 358)
- Power Unit Port Status (page 374)

AC Power

Table 110: Power Unit AC Power LED (Green)

LED Status	Meaning	Main Voltage
ON	Unit plugged in and operating normally.	42–57 V.
Flashing	PORT STATUS GREEN LED ON: Main power voltage outside specified limits.	38–42 V *OR* 57–59 V. Port power on.
	PORT STATUS GREEN LED OFF: Main power voltage outside specified limits.	< 38 V *OR* > 57 V. Port power OFF.
OFF	Unit is not plugged in. *OR* Unit is faulty.	< 12 V.

Power Unit Alarm

Table 111 below shows the meaning of the Alarm LED.

Table 111: Power Unit Alarm LED (Orange)

LED Status	Meaning
ON	Built-in self test failed.
Flashing	Software load failure. Re-install the software.
OFF	Built-in self test passed.

Power Unit Port Status

Each port pair has two Status LEDs:

- Power Active LED (Green LED)
- Power Inactive LED (Orange LED)

Table 112: Power Unit Port Status LEDs

LED Status		Meaning	Port Voltage
Green	Orange		
ON	OFF	Active load plugged in, and complying to normal load conditions.	Continuous nominal DC voltage present on spare pairs.
OFF	ON	Overload condition. *OR* Shorted terminal port. *OR* Forced external DC voltage feed into port.	Power to the port disconnected. No DC voltage on spare pairs.
ON	ON	Internal hardware fault.	No DC voltage on spare pairs.
Blinking	OFF	Load detection in progress. *OR* Discharged capacitor in PDTE.	Power disconnected. No DC voltage on spare pairs.
OFF	Blinking	Total aggregate power exceeds predefined power budget.	Power disconnected for the blinking port.
OFF	OFF	Non-active load. *OR* Unplugged load.	No DC voltage present on spare pairs.

Appendix E

FRU Part Numbers

Hardware Part Numbers

Table 113: Hardware Part Numbers

Part Number	Description
3300 ICP Controllers, software, and components	
50006269	MXe III Controller
50005363	MXe II Controller, expanded, 1400-user
50005080	MXe II Controller, HD, i-Button, base software, AMB II, AC power
50005090	MXe 363 (MXe II)
50005096	CX Controller, HD, i-Button, base software, AMB II
50005097	CXi Controller, HD, i-Button, base software, AMB II, and Ethernet
50006093	CX II Controller
50006094	CXi II Controller
50005180	AX Controller, Flash Cards, i-Button, AC power
3300 ICP Controllers with components	
50005181	AX Controller Card
50005592	MXe Server (MXe with dual hard drives, RAID, dual power supplies, E2T, RTC and APC-MXe)
3300 ICP Components	
1695MTLHSG	3300 CITELlink Gateway (Norstar)
1898MTLHSG	3300 CITELlink Gateway (Meridian)
50001246	3300 - 64 Channel Echo Canceller
50001247	3300 - 128 Channel Echo Canceller
50001248	Dual FIM (820 nm, multimode)
50002212	3300 Spare System ID Module LX
50002979	3300 Quad DSP MOD II (21161)
50005751	DSP II MMC
50003560	Dual T1/E1 Trunk MMC (AX, MX, MXe, LX, 250/700-user)
50003695	Dual FIM (1300 nm, multimode)
50003696	Dual FIM (1300 nm, singlemode)
50003724	Analog Main Board (MX only)
50003725	Analog Option Board (MX only)
50003726	Stratum 3 Clock Module
50003728	3300 Dual DSP
	Page 1 of 8

Table 113: Hardware Part Numbers (continued)

Part Number	Description
50004070	3300 Quad BRI Module
50004402	T1/E1 Combo MMC (CX/CXi)
50004451	Quad CIM MMC
50004403	Analog Main Board (CX/CXi only), Version I Note: AMB Version I and AOB Version I are superseded by the following parts: • PN 50004870 Analog Main Board II (CX/CXi, MXe) • PN 50005184 Analog Main Board III (CX/CXi,MXe) • PN 50004871 Analog Option Board, Version II (CX/CXi only)
50004870	Analog Main Board II (CX/CXi, MXe), Version II
50005184	Analog Main Board III (CX/CXi, CX II/CXi II, MXe), Version III
50004401	Analog Option Board (CX/CXi only), Version I Note: Analog Option Board, Version I (PN 50004401) only works with the Analog Main Board, Version I (PN 50004403)
50004871	Analog Option Board (CX/CXi and CX II/CXi II only), Version II Note: This AOB is only compatible with the AMB Version II (PN 50004870) and AMB Version III (PN 50005184).
50004920	3300 Spare i-Button
50006431	MXe III RAID Controller Sub-system
50005086	MXe II RAID Controller Sub-system
50006432	MXe III Processor (RTC / E2T)
50005087	MXe II Processor (RTC / E2T)
51010725	Application Processor Card (APC-CX(i)) (for CX or CXi only)
50005190	Application Processor Card (APC-MXe) (for MXe Server only)
50006095	Application Processor Card (APC-CX(i) II) Assembly (for CX II or CXi II only)
50005103	16 Port ONS Card (AX and ASU II)
50005104	4 + 12 Port Combo Card (AX and ASU II)
50005533	3300 16 Port ONSP Card (for all markets, including Brazil)
50005731	3300 24 Port ONSP Card (for all markets, excluding Brazil)
50005160	T1/E1 Combo MMC II
50005441	4 GB Voice Mail Flash (for AX only)
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Table 113: Hardware Part Numbers (continued)

Part Number	Description
50005883	512MB RAM Module
50005981	Memory Kit - 2G Flash with 512MB RAM Module
50005491	Brazil Connectivity Kit (for 50005104, 50005080, 50005096, 50005097, 50005362, 50005363, 50004871, 50003724, 3725)
Services Units	
50001266	3300 Universal ASU (NA)
50001267	3300 ASU, 24 Port (NA)
50001268	3300 Universal ASU (UK)
50001269	3300 ASU, 24 Port (UK)
50001275	3300 BRI NSU (Euro)
50002046	3300 ASU, Unit 24 Port (LA)
50002047	3300 Universal ASU (LA)
50002813	3300 ASU, 24 Port (Euro)
50002814	3300 Universal ASU (Euro)
50003901	R2 NSU (I3BC) (Iran)
50004990	3300 Universal NSU T1/E1 (NA)
50004991	3300 Universal NSU T1/E1 (Euro)
50004992	3300 R2 NSU, 110/220 V
50005105	3300 Analog Services Unit II with AC Power Supply
Power Units	
50000363	Power Distribution Unit
50000687	24 VDC IP Power Adapter 240V 50Hz, Euro (Qty 1)
50000690	24 VDC IP Power Adapter Unit 110V, 60Hz (Qty 1)
50002070	48 VDC Ethernet/AC Power Adapter, NA, 120V 50-60Hz
50002090	48 VDC Ethernet/AC Power Adapter, Euro, 240V 50Hz
50002230	Power Cord 3-Pack (Australia/New Zealand)
50002618	3300 Phone Power Adapter In-Line 6-Pack (UK)
50002619	3300 Phone Power Dongle In-Line (UK)
50005611	Power Cord single - Euro (replaces Euro 3 Pack -2952)
50002976	Power Cord 3 Pack (NA)
50005612	Power Cord single - UK (replaces UK 3 Pack - 2977)
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Table 113: Hardware Part Numbers (continued)

Part Number	Description
50002922	3300 Power Dongles (Cisco compliant), 10-Pack
50005084	MXe AC Power Supply
50005091	ASU II AC Power Supply
50005182	AX AC Power Supply
50005183	AX DC Power Supply (FUTURE)
50005320	48VDC Power Supply Universal 100-240V
50005471	AX Fan Assembly
50006510	CX II/CXi II Fan Assembly
50005683	MXe, CX II/CXi II Fan Assembly
51000582	C7 Power Cord with UK Plug
51002525	3300 Phone Power Dongles (6-Pack)
51004716	3300 In-Line Power Unit
51004990	C7 Power Cord with Euro Plug
51005172	C7 Power Cord with NA Plug
Consoles	
50001145	5550 IP Console (Light Grey)
50002028	5550 IP Console Software CD-ROM
50003071	5550 IP Console (Dark Grey)
50003370	5550 IP Console / SC2000 Keypad Feet (Set of 2)
50003372	5550 IP Console Keypad Dark Grey (Spare)
9189-000-400-NA	SUPERCONSOLE 1000®, Light Grey, Backlit
9189-000-401-NA	SUPERCONSOLE 1000, Dark Grey, Backlit
50005811	5540 IP Console
SX-2000 Cabinets and Cards	
50000730	CEPT Interface Assembly II
50001856	SX-2000 Triple FIM Card
50002375	Peripheral Cabinet, dark grey, 120 V, AC (UK)
50002370	Peripheral Expansion Cabinet, dark grey, 120 V (NA)
50002371	Peripheral Expansion Cabinet, dark grey, 240 V (NA)
50002372	Peripheral Expansion Cabinet, dark grey, 120 V (UK)
50002373	Peripheral Cabinet 19", dark grey, 120 V AC NA

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Table 113: Hardware Part Numbers (continued)

Part Number	Description
50002374	Peripheral Cabinet 19” 240 V AC NA
50002375	Peripheral Cabinet 19” 240 V AC UK
50002376	Peripheral Cabinet Door 19 inch, dark grey, (Qty 2)
50002572	Peripheral Cabinet FRU 19 inch
50004201	Redundant Control Node with MCIIIE(AC) Int’l
50004202	Redundant Control Node with MCIIIE (DC)
50004203	Peripheral Cabinet III 120 V (NA)
50004204	Peripheral Cabinet III 240 V (Int’l)
50004205	Peripheral Cabinet III DC
52001400	Peripheral Cabinet Expander Kit
9125-100-100-NA	EMI Filter Kit
9125-100-106-NA	Cabinet Interconnect Cable, 4.5 m (15 ft)
9180-305-000-NA	System Fail Transfer Unit (6 circuit)
9400-200-116-BA	Peripheral Cabinet II 240 V
9400-200-116-BX	Peripheral Cabinet II 240 V
9400-200-116-DB	Peripheral Cabinet II DC
9400-200-116-DC	Peripheral Cabinet II DC
9400-200-118-NA	Peripheral Cabinet II (AC)
9400-200-119-NA	Peripheral Interconnect Card
9400-200-122-BA	DSU Cabinet (DC) (UK)
9400-200-122-NA	DSU Cabinet (DC)
9400-200-124-BA	DSU Cabinet (AC) (UK)
9400-200-124-NA	DSU Cabinet (AC)
9400-200-125-NA	DSU Cabinet (AC)
9400-200-144-NA	Cabinet Stacking Brackets
9400-200-161-BA	MicroLIGHT MCIIIE UK
9400-200-161-BX	MicroLIGHT MCIIIE Int’l
9400-200-161-NA	MicroLIGHT MCIIIE
9400-200-161-NX	MicroLIGHT MCIIIE Int’l 120 V
9400-200-162-BA	MicroLIGHT MCIIIE (DC) UK
9400-200-162NA	MicroLIGHT MCIIIE (DC)

Table 113: Hardware Part Numbers (continued)

Part Number	Description
9400-200-163-BA	Redundant Control Cabinet with MCIIIE UK
9400-200-163-NA	Redundant Control Cabinet with MCIIIE
9400-200-164-BA	Redundant Control Cabinet with MCIIIE (DC) UK
9400-200-163-NA	Redundant Control Cabinet with MCIIIE (DC)
9400-200-200-NA	Power Module Redundant (in Control Node)
9400-200-301-NA	Peripheral/DSU Resource Card
9400-200-303-NA	Peripheral Slot FIM Carrier Card
9400-200-304-BA	SUPERSET Hub Unit
9400-200-306-BA	SUPERSET Hub Package
9400-200-310-NA	Doors for Control/Peripheral Cabinets (Pkg. of 2)
9400-300-202-BA	Fan 240 VAC
9400-300-204-NA	AC Power Supply
9400-300-301-NA	Fiber Interface Module (FIM)
9400-300-302-NA	Quad FIM Carrier
9400-300-308-NA	DSU Slot FIM Carrier
9400-300-310-NA	FIM Carrier Card
9401-000-024-NA	Music on Hold Paging Unit (DNIC)
MA218AA	DS1 Interface Assembly
MA225AA	PRI Interface Assembly
MA501AA	BRI Interface Assembly
MC268AA	6 Circuit BRI Card
MC268AB	15 Circuit BRI card
MC269AA	Euro ISDN Dual Link PRI Card
MC269CA	CEPT II Formatter Card
MC270AA	PRI Card, T1 Dual Link
MC270CA	DS1/T1 II Formatter card
MC271AA	E1 R2 Dual Link Card
MC312AB	Peripheral Switch Control II Card
MC320CL	ONS CLIP Line Card (UK) with Positive Disconnect (16 circuit)
MC320CM	ONS CLASS IBR Line Card (16 circuits)
MC320EA	ONS CLASS Line Card (16 circuits)
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Table 113: Hardware Part Numbers (continued)

Part Number	Description
MC320FA	ONS CLASS Line Card with Positive Disconnect
MC321AC	OPS Line Card (8 circuits)
MC330AB	DNI Line Card (16 circuits)
MC340BA	LS/GS Trunk Card (8 circuits) - (available in NA only)
MC341CA	DID/Loop Tie Trunk Card (4 circuits)
MC342BB	E&M Tie Trunk Card (4 circuits)
MP914AA	AC Power Converter
MW401AA	BRI Cable - MDF 25 pair cable, 3 m (10 ft)
MW401AB	BRI Cable - MDF 25 pair cable, 10 m (32.5 ft)
MW402AA	BRI CEPT Cables
MW403AA	BRI MMI Cable
MW404AA	RJ-45 to Coaxial Adapter cables
SX-200 Bays	
52001551	SX-200 Per Node BCCIII - Drk Gry,110V
52001552	SX-200 Per Node BCCIII - Drk Gry, 220V
9109-117-001-NA	Bay Control Card III (MC293AA)
9109-008-000-SA	Bay Power Supply (120 VAC)
9109-008-003-NA	Bay Power Supply (230 VAC)
9109-010-000	12-Port ONS Line Card (MC288AA)
9109-010-001	12-Port ONS Line Card (MC288AA)
9109-010-002	12-Port ONS (MC288AA)
9109-010-002-SA	12-Port ONS (MC288AA)
9109-010-003	12-Port ONS Line Card - ML (MC289AA)
9109-040-000	6-Port OPS Line Card (MC290AA)
9109-040-000-SA	6-Port OPS Line Card (SFTY) (MC290AA)
9109-012-000	12-Port Digital Line Card (MC291AA)
9109-012-001-NA	12-Port Digital Line Card (MC291AA)
9109-012-002-NA	12-Port Digital Line Card - ML (MC292AA)
9109-110-001-NA	12-Port ONS CLASS Line Card (MC294AA)
9109-110-003	12-Port ONS CLASS - ML (MC295AA)
9109-616-001-NA	Peripheral Interface Module Carrier Card

Table 113: Hardware Part Numbers (continued)

Part Number	Description
9180-510-001-NA	FIM Module - 820nM Multi-mode. Connects to 3300 Part Number 50001248
9180-510-002-NA	Fibre Interface Module - 1300 nM Multi-mode. Connects to 3300 Part Number 50003695
9180-510-003-NA	Fibre Interface Module - 1300 nM Single Mode. Connects to 3300 Part Number 50003696
9180-510-006-NA	DSP Module (Single)
9180-510-010-NA	Copper Interface Module
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Software Part Numbers

Table 114: Software Part Numbers

Part Number	Description
50005153	3300 6.1 Configuration Tool Upgrade (CD-ROM)
50005591	3300 8.0 S/W CDROM MEDIA KIT (Includes: 3300 8.0S/W CDROM, Tech Handbook, Mitel Communications Director Installation CD, and 5550 CDROM)
50005413	APC-CX(i) Software Media Kit
50006489	160 GB PATA Hard Disk Drive and MCD software for MXe III (2-pack)
50006513	160 GB SATA Hard Disk Drive and MCD software for MXe III
50006265	160 GB SATA Hard Disk Drive and MCD Software for CX II and CXi II
50005686	80 GB PATA Hard Disk Drive and MCD software for MXe II (2-pack)
50006266	8 GB SATA Solid State Drive and MCD Software for CX II and CXi II
50006268	32 GB SATA Solid State Drive and MCD Software for MXe III
50006292	32 GB PATA Solid State Drive and MCD Software for MXe II
50006512	80 GB SATA Hard Disk Drive and MCD Software for MXe III
50006294	80 GB SATA Hard Disk Drive and MCD Software for CX II and CXi II
50006352	80 GB PATA Hard Disk Drive and MCD software
9125-070-002-NA	PRI T1 Card CD-ROM Software
9125-070-011-NA	Euro ISDN PRI Card Release 6 Application Software

Table 114: Software Part Numbers (continued)

Part Number	Description
9125-070-012-NA	ISDN PRI Card Release 6 Application Software
9125-271-000-NA	R2 Application CD-ROM Software
9125-501-001-NA	ISDN Min/Max Software Option for the PRI Card
9125-501-002-NA	ISDN Auto Min/Max Software Option for the PRI Card
9125-501-003-NA	ISDN NFAS Software Option for the PRI Card
9125-501-004-NA	ISDN D-Channel Back up Software Option - PRI Card
9125-501-005-NA	ISDN Remote LAN Access Software Option - PRI Card

Appendix F

System Capacity and Parameters

System Parameters

Port Usage

Table 115: Port Usage

Function	Port/Socket Number
IP Trunk (unsecured)	1066
IP Trunk (SSL)	1067
Software Log	1750
Maintenance Log	1751
SMDR	1752
PMS/Hotel Logs	1753 (only one direction)
LPR1 (printer port)	1754
UDP/TCP for SIP	5060
TLS (transport layer security) for SIP	5061
E2T to RTC (SSL)	6000
Set to ICP (Unsecured)	6800
Set to ICP (SSL)	6801
Set to ICP (Secure Minet)	6802
PMS for voice mail port	6830
E2T voice UDP ports (prior to Rls 6.0)	RTP/UDP 5000 to 5512
E2T voice UDP ports (post Rls. 6.0)	RTP/UDP 50000 to 50255
E2T voice UDP ports ((post Rls.8.0)	RTP/UDP 50000 to 50511
RTC	TCP 6800
IP Sets	TCP 6900
IP Sets - Voice B1/B2, Rx	RTP/UDP 50000/50511
IP Sets - Voice B1/B2, Tx	RTP/UDP 50000/50511
ACD Real Time Event	15373
IP PMS (Release 6.0)	15374
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Table 115: Port Usage (continued)

Function	Port/Socket Number
5550 Console Keypad to Console PC (See Note)	6800 (PC must allow inbound TCP sessions to port 10000)
Console PC to ICP (See Note)	6800, 7011, 1606
Note: These TCP ports must not be blocked or conflict with other applications running on the console PC.	
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For a more complete list, refer to the *3300 ICP Engineering Guidelines*.

Encryption Support

Signaling encryption is device dependent and used whenever supported. Voice stream encryption is optional and used if both endpoints support it. Calls initiated on a 3300 ICP or a legacy IP set which does not support encryption (pre-release 6.0) are supported, but will not be encrypted. The encryption scheme used for voice (AES or Cast) is negotiated by the endpoints during call setup

For information on application support for encryption, see the *3300 ICP Engineering Guidelines*.

Table 116: E2T/TDM Encryption

Device	Signaling Mode	Voice Streaming Mode
E2T	SSL/Secure Minet	AES/No encryption

Table 117: Telephone Encryption

Telephone	Signaling Mode	Voice Streaming Mode
5215DM/5220DM, 5235, 5212, 5224, Navigator, 5312, 5320, 5324, 5330, 5340, 5360	SSL/Secure MiNet	AES/Cast/No encryption
5001, 5005, 5010, 5015, 5020, 5140, 5201, 5205, 5207, 5215, 5220, PDA (5230), 5240	Secure MiNet	AES/No encryption
TeleMatrix 3000IP	Secure MiNet	AES/No encryption

IP Set Features

Table 118: IP Set Features

Option	5201, 5207	5212, 5215, 5230, 5235, 5240, 5312, 5324	5220, 5224	5320, 5330, 5340, 5360	Navigator	TeleMatrix 3000IP, 5560 IPT
Compression Support	G.711	G.711 G.729a	G.711 G.729a	G.711 G.729a	G.711 G.729a	See Note 1
Voice QoS (802.1p/q)	Yes	Yes	Yes	Yes	Yes	Yes
FCC CLASS B Support	Yes	Yes	Yes	Yes	Yes	See Note 1
POE using Spare Pair or Signal Pair (802.3af)	Yes	Yes	Yes	Yes	Yes	Yes
AC Power Adapter (24 VDC)	No	No	Yes	No	No	Yes
Peripherals (Modules) Support						
PKM	No	No	Yes	No	No	No
Conference Unit	No	Only on 5235	Yes	Yes	No	No
Gigabit Stand	No	Only on 5212, 5215, 5312, 5324	Yes	Yes	No	No
Wireless Stand	No	Yes (except 5230 & 5240)	Yes	Yes	No	No

Note 1: Refer to TeleMatrix 3000IP Technical documentation for details.
Note 2: The 5550 console requires only an external AC power adaptor.
Note 3: For the conference unit using a side control unit, an external AC power adaptor is required.
Note 4: Any Cisco switch that is non-compliant with 802.3af requires a Cisco power dongle.

Optional Power Adapter for NA: 50002070 - 5x01, 5x05, 5215;
50000690 - 5x10, 5x20 (except 5320), 5x30, 5x40, 5305, 5310, 5485, 5550;
50002070, 50005080, 50002090 - 5235 (with a DNIC interface module);
9132-800-210-NA - 4015IP, 4025IP.

IP Phone Power Consumption

Table 119: Actual Phone Set Power Consumption

Device	Typical Power consumption (W)
5001 IP Phone	2.0
5005 IP Phone	2.6
5010 and 5020 IP Phones	5.0
5201 IP Phone	2.0
5205 IP Phone	2.9
5207 IP Phone	3.0
5212, 5215, 5215 (dual mode), 5220, 5220 (dual mode), 5224 IP Phones	4.7
5230 IP Appliance	5.2
5235	6.2
5140 and 5240 IP Appliances	6.8
5302 IP Phone	3.8
5304 IP Phone	6.5
5312 IP Phone	4.2
5320 IP Phone	4.3
5324 IP Phone	4.3
5330 IP Phone	4.7
5340 IP Phone	5.8
5360 IP Phone	7.4 (10/100 MB mode) 8.6 (GB mode)
5485 Paging Unit	5.0
5550-TKB (Used with the 5550 IP Console	5.0
MITEL 3300 power dongle	1.4
Navigator	8.6
TeleMatrix 3000IP	4.7
5560 IPT	12.9 (estimated worst case)

Capacity

Hardware Capacity

The following tables provide a view of the maximum capacity of the 3300 ICP. The capacities in these table are for a non-resilient 3300 ICP.

Tip: The capacities in Table 120 are not true hardware limitations, but may be limits set by software. Most systems will reach practical operational limitations before these large numbers of devices are reached.

Table 120: 3300 ICP Hardware Capacity

Parameter Name	LX/700 User	250 User	100 User/ MX	MXe Base/ Expanded	MXe Server	CX / CXi	CX II / CXi II	AX
Compression Channels (G.729a)	64	32	32	64/128	256	64	64	64
DTMF Receivers	128	128	128	128	128	128	64+	128
Echo channels/E2T	128	64	64	64/128/ 192[2]	256	64	64	128[6]
Tone Detector Circuits	32	32	32	32	32	32	32	32
Tone Generators	128	128	128	128	128	128	128	128
Voice Mail Ports	30	30	30	30	n/a	16	16	20
Dual FIMs	4 / 3	3	1 / 2	4	n/a	n/a	n/a	1
T1/E1 Modules	3	3	1 / 2	4	n/a	2	2	1
NSUs (without chaining) NSUs (with chaining)	4 8	4 8	2 4	4 8	n/a n/a	n/a n/a	n/a n/a	1[3] 2[3]
Peripheral Cabinet (direct connection) Expanded Cabinet	6 12	3 6	2 4	6 12	n/a n/a	n/a n/a	n/a n/a	n/a n/a
ASUs	4	4	2	12	n/a	3	3	n/a
SX-200 Bays	n/a	n/a	n/a	7	n/a	n/a	n/a	n/a
Trunks (analog and digital combined)	628	350	192/ 350	628	n/a	72	72	108
BRI U Interfaces (with NSU)	60	60	30	60	n/a	n/a	n/a	n/a
IP Trunks between any two controllers	200	200	200	200	200	200	200	200

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Table 120: 3300 ICP Hardware Capacity (continued)

Parameter Name	LX/700 User	250 User	100 User/ MX	MXe Base/ Expanded	MXe Server	CX / CXi	CX II / CXi II	AX
ACD Agents[1]	350	200	80/100	350	350	50	50	50
IP Trunks per controller	2000	2000	2000	2000	2000	2000	2000	2000
Attendant Consoles	24	16	8	24	24	8	8	8
IP Devices	LX-1400 /700	250	100/200	350 / 1500[4]	5600	100	150	100 /300[5]
Programmable Key Modules	75	75	75	75	75	75	75	75

Notes:

[1] A combination of IP and DNI phones (no DNI in the CX/CXi, CX II/CXi II, or AX, or MXe Server). Refer to *3300 ICP Engineering Guidelines* for details.

[2] The largest number is available only with the 192 channel PSTN gateway configuration.

[3] R2 NSU only

[4] Maximum 300/1400 IP users

[5] The larger number is for light traffic (Hospitality sites) only.

[6] The AX controller uses DSP echo cancellers (40 channels in total) in its default configuration, but can use the 128-channel module to increase capacity. When the 128-channel module is installed, the echo canceller channels on the embedded DSPs revert to telecom resource use.

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Table 121: Hard Drive Capacities

Capacity	Mitel Part Number	Vendor	Vendor Reference ID
40 GB	50004750	Maxtor	6E040L0
			6K040L0
80.0 GB	50005686	Hitachi	0Y30001
			0Y30003
		Seagate	ST380215A
82.3 GB	50005452	Hitachi	0A302210
			0A32721
			0A34078

System Capacity

Tip: Digital Links are also limited by the number of dual FIMs available on the controller.

Table 122: System Capacity

Parameter Name (numbers in brackets are minimum and maximum values with flexible dimensioning)	**Maximum Value** (default maximum)
IP User Licenses	5600 (1400)
ACD Active Agent Licenses	350
SIP Trunk Licenses	2000
Analog Port Licenses	5000
Voice Mail Licenses	750 (including Advanced Voice Mail licenses)
Mailbox Licenses	750
Digital Link Licenses	16
ACDII Agent Groups	64, 32 (extended)
ACDII Agents per Group	150, 500 (extended)
ACDII Agent Appearances	8
ACDII - Agent IDs	1181
ACDII - Agent Paths	256
Attendant Consoles (2-48)	24
Attendant Groups (2-100)	48
Attendant Console Calls Waiting	72
Broadcast Groups (12-16000)	1875 (9000 for 512MB)
- Members per Broadcast Group	32
Busy Lamp Groups (Monitored Devices) (2-5000)	439
- Members per Busy Lamp Group	16
Call Reroute Always (10-250)	175
Call Reroute 1st Alternates (10-500)	336
Call Reroute 2nd Alternates (10-100)	32
Class of Restriction (COR)	96
Class of Service (COS) (10-96)	96
Conferences; maximum (see note 2)	21
Conferees in a conference; maximum (see note 2)	8

Table 122: System Capacity (continued)

Parameter Name (numbers in brackets are minimum and maximum values with flexible dimensioning)	**Maximum Value** (default maximum)
Default Account Codes (10-600)	225
Departments (in Telephone Directory) (10-5000)	2000
Digit Modification Tables	256
Digit Blocks - Maximum	12000 for CX, CXi, MX, MXe, and LX systems with 256 MB memory and 999 Maximum Elements Per Cluster configured in the License and Options Selection form or 4055 for other cluster sizes. 12055 for LX systems with 512 MB memory. 12255 for LX systems with 512 MB memory and 5600 IP devices configured. 20000 for LX systems with 512 MB memory and 999 Maximum Elements Per Cluster configured in the License and Options Selection form. 12255 for MXe Server.
DTMF Receivers	192
Hunt Groups (10-255)	176, 16 (extended)
- Members per Hunt Group	64, 240 (extended)
Independent Account Codes (10-15000)	11000
Locations (in Telephone Directory) (10-5000)	250 / 1000 (see note 1)
Modem Groups (2-25)	15
Modems per Modem Group	10
MSDN/DPNSS Cluster Elements	30
MSDN/DPNSS Remote Directory Numbers	18500
Multiline Sets (12-6000)	756 (5665 for 512MB memory)
Networked ACD - Remote Agent Subgroups	32
Page Groups (Zones) (2-100)	16
Personal Speed Call Users (10-1000) (blocks of 10 speed calls per user)	500
Pickup Groups (10-800)	200
- Members per Pickup Group	75
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Table 122: System Capacity (continued)

Parameter Name (numbers in brackets are minimum and maximum values with flexible dimensioning)	**Maximum Value** (default maximum)
PKM Devices (2-500)	75
Routes (10-2400)	200 / 1200 (see note 1)
Route Lists (10-1200)	128 / 600 (see note 1)
Single Line Sets (16-5000)	700
Speed Call Digit String (average 12 digits) (65000 max)	2501
SUPERSET Callback Messages per System (48-10000)	500
System Account Codes (10-100)	24
System Digit Strings (65000 max.)	1000 / 30001 (see note 1)
System Speed Call (10-3000)	1000 / 2000 (see note 1)
Telephone Directory Entries (55-65000)	20000 / 30000 (see note 1)
Trunk Groups (8-320)	112
Trunks (8-2000)	628
Trunks per Trunk Group	175
Trunk Service Numbers (8-500)	150
Note 1: Default value (larger number) when 250 Maximum Elements Per Cluster is selected. Note 2: Any combination of conferees and conferences may not exceed 64 channels. For example, 21 three-party conferences for a total of 64 channels or eight eight-party conferences for a total of 64 conference channels. (The MXe Server will support 128 conferees in its maximum configuration.)	
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Appendix G

Older Hardware and Software

Procedures for older controllers

Programming the Controller DHCP Server Settings (prior to Rel 7.0)

For additional information on programming DHCP settings for the 3300 ICP, refer to the System Administration Tool Online Help.

To use an external DHCP Server, do not enable the internal DHCP server and refer to “Configuring External DHCP Settings for E2T” on page 289 for instructions.

Tip: You may need to change the IP address of your PC to match your customer’s network.

1. On the Maintenance PC, access the System Administration Tool (see "Log into the Programming Tools" on page 71).
2. In the **All forms (alphabetical)** list, click **DHCP Subnet** form, enter
3. In the DHCP Static IP form, enter a static IP address for the E2T using the information on page 283 (skip this step for the MX and 100-user controllers). Assign IP addresses to specific devices by using the MAC address of the device. Assign a static IP Address to any IP Console in a cluster.
4. In the **DHCP IP Address Range** form, program the scope using the information on page 284. See “Reserved IP Addresses” on page 277.
5. In the **DHCP Options** form, program the options listed in Table 57 on page 284 for the scope you just programmed. Always create the following options:

   - 3 Router, IP address
   - 66 TFTP Server, IP address format
   - 67 Boot file, string value (always /sysro/E2T8260)
   - 128 TFTP, IP address format (typically the controller)
   - 129 RTC, IP address format (typically the controller)
   - 130 MITEL IP PHONE, string value

   In a single DHCP configuration, create the following options:

   - 132 VLAN ID (optional)

- 133 Priority, integer value of 1-6 (Optional. Required if a voice VLAN is in use. For external server use Hex LONG; for internal server use decimal value of 1-6)
- 134 Diffserv Code Point, integer value

If there are 5230 IP Appliances, create the following options:

- 6 DNS Server, IP address format
- 44 NetBIOS Name Server, IP address format

6. In the **DHCP Options** form, for a cluster environment, program IP Console (if any) with a static IP Address. Then, do the following:

   Program Options 128 and 129 with:
   - Format: IP Address
   - Value: IP Address of the controller that controls the device
   - Scope: Static: <device name><subnet>.

   If different VLAN tagging and priority information is needed for the IP Console, repeat step 6 for Options 132 and 133.

   If a different router is need for any IP Consoles, repeat step 6 for Option 3 and set the Value to the IP address of the router.

7. In the **DHCP Lease Viewer** form, ensure that there is no DHCP IP Address Lease for the IP Console MAC Addresses. If there is, delete it and then power off and power on the device.

8. In the **DHCP Server** form, enable the internal DHCP server.

To use an alternative DHCP server (prior to Rel 7.0)

See page 289 and page 289:

1. In the **DHCP Server** form, disable the internal DHCP server.

2. Program your DHCP server with the following options:

   - 128 TFTP IP address format
   - 129 RTC IP address format
   - 130 MITEL IP PHONE, string value.

Configuring a Windows 2000 DHCP Server (prior to Release 7.0)

You can modify a Windows 2000 DHCP server to support IP Phones. A DHCP server must be configured for each subnet. The following items must be configured:

- TFTP Server IP address
- IP address of the RTC card
- Mitel tag “MITEL IP PHONE”

To modify a Windows 2000 DHCP Server:

1. In the **Start** menu, point to **Programs**, then **Administrative Tools**, and click **DHCP**.
2. Highlight the Server name and point to **Action**, then click **Set Predefined Options**.
3. In the **Predefined Options and Values** window, click **Add**.
4. In the **Option Type** window, set the following:
   - **Name**: IP phone TFTP Server IP Address
   - **Type**: IP Address
   - **Code**: 128. Then click OK.
   - **Value**: enter the IP address of the TFTP server (the controller RTC) then click **OK**.
5. In the **Predefined Options and Values** window, click **Add** again.
6. In the **Option Type** window, set the following:
   - **Name**: RTC IP Address
   - **Type**: IP Address
   - **Code**: 129. Then click OK.
   - **Value**: enter the IP Address of the RTC card. Click **OK**.
7. In the **Predefined Options and Values** window click **Add** again.
8. In the **Option Type** window, set the following:
   - **Name**: Mitel Vendor String
   - **Type**: String
   - **Code**: 130. Then click **OK**.

- **Value**: MITEL IP PHONE. Click **OK**.

Tip: If you are using VLANs complete all of the following steps.
If you are not using VLANs complete steps 13 to 18 and step 21.

9. In the **Predefined Options and Values** window click **Add** again.
10. (optional) In the **Option Type** window, set the following:
    - **Name**: VLAN ID
    - **Type**: Hex LONG (32 bit word)
    - **Code**: 132. Then click **OK**.
    - **Value**: enter a numeric value for the Voice VLAN. Click **OK**.

Tip: The server will automatically convert the numeric value to Hex.

11. In the **Predefined Options and Values** window, click **Add** again.
12. (optional) In the **Option Type** window, set the following:
    - **Name**: Priority
    - **Type**: Hex LONG
    - **Code**: 133. Then click **OK**.
    - **Value**: enter a value from 1 to 7; Mitel recommends **0x6**. Click **OK**.

Tip: The server will automatically convert the numeric value to Hex.

13. Highlight the **Scope** which contains the IP range for the IP Phones and select **Scope Options**.
14. In **Action**, click **Configure Options**.
15. In **General**, select option **003 Router** and enter the IP address of the default Gateway and then click **Add**.
16. Select Option **128**.
17. Select Option **129**.
18. Select Option **130**.
19. Select Option **132**.
20. Select Option **133**.
21. Click **OK**.]

Program DHCP for VLAN (prior to Rel 7.0):

Follow this procedure if using two DHCP servers: central server (external) on a default VLAN and other (3300 DHCP Server) on the voice VLAN.

1. Set up the central DHCP Server with the following options:
   - 130 MITEL IP PHONE, string value
   - 132 VLAN ID
   - 133 Priority, value of 1-6
   - 134 Diffserv Code Point, integer value
2. Set up the 3300 ICP DHCP Server with the following options:
   - 128 TFTP IP address format
   - 129 RTC IP address format
   - 130 MITEL IP PHONE, string value
   - 132 VLAN ID
   - 133 Priority, value of 1-6
   - 134 Diffserv Code Point, integer value
3. Program the DHCP server on the 3300 ICP (see "Program the Controller DHCP Server (MXe, CX/CXi, CX II/CXi II)" on page 76).

Windows 2000 FTP Server

Figure 170, Figure 171 and Figure 172 below show examples of the settings needed on a Windows 2000 FTP server.

To program these FTP settings

1. Open the **Computer Management** control panel (**Start**/**Settings**/**Control Panels**/**Administrative Tools**/**Computer Management**).
2. In **Services and Applications**, click on **Internet Information**.
3. Program the settings as shown below (use the **IP Address** drop-down menu to select the PC's IP address).

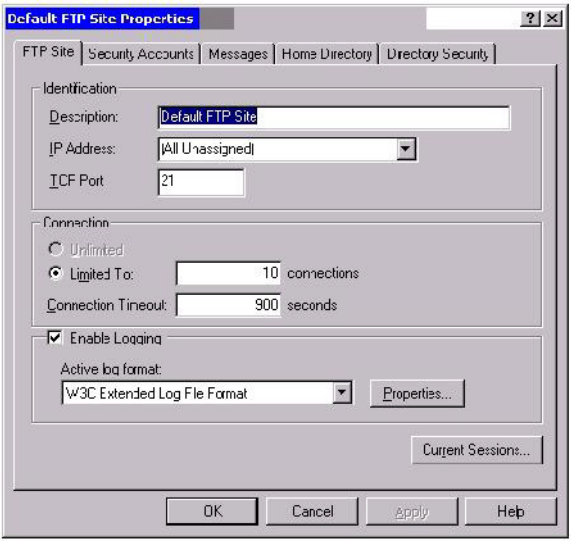

Figure 170: Windows 2000 FTP Site Tab

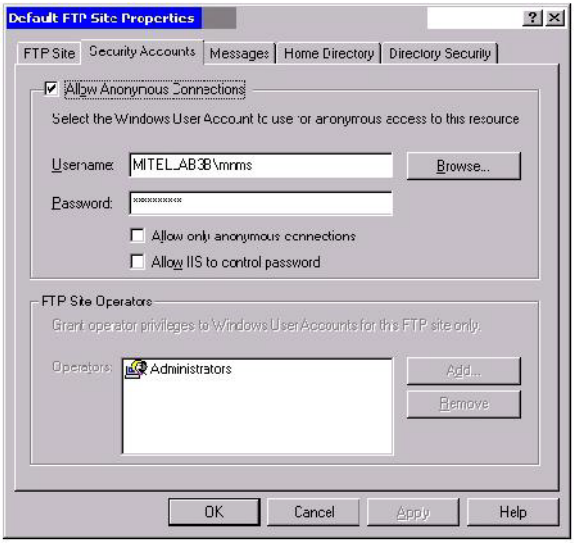

Figure 171: Windows 2000 Security Accounts Tab

Figure 172: Windows 2000 Home Directory Tab

Connect a Windows 95/98 PC to the NSU via Dial-Up

Tip: You can also connect the PC to the NSU via a modem (remote connection). For more information, see the IMAT Online Help.

Tip: Refer to the IMAT online help for dial-up connection details when your PC is running on Windows NT 4.0, Windows 2000 Professional, or Windows XP without a NIC.

By default, Windows does not support a direct cable connection. You must add a device driver. Windows takes the information from a Mitel file and creates the driver called NT Direct Connection.

To install a Direct Connection Device Driver (Windows 95/98):

1. On the **Start** menu, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Modems** icon.
3. In the **Modem Properties** window, click **Add**.
4. In the **Install New Modem** screen, click **Other**.
5. Select **Don't detect my modem, I will select from a list**, then click **Next**.

6. Click **Have Disk**.
7. Type **c:\Program Files\Mitel\Imat** in the **Copy manufacturer's files from** field, then click **OK**.
8. In the **Install from Disk** window, click **OK**.
9. Click **Next** to select the NT Direct Connection.
10. Select **COM 1** or **COM 2**, and then click **Next**.
11. Click **Finish**.
12. In the **Modem Properties** window, select **NT Direct Connection**, then click **Properties**.
13. Set the following parameters:
    - Maximum speed: **38 400**
    - Check: **Only connect at this speed**
    - Data bits: **8**
    - Parity: **None**
    - Stop bits: **1**
    - Mode: **Auto Answer**

    In **Advanced Settings** window, do the following for a direct connect cable:
    - Turn off: **Error control**
    - Turn off: **Flow Control**
14. Click **OK** and close the Control Panel window.

Physically Connecting the PC to an NSU

- Connect an RS-232 straight DTE serial cable between the NSU's serial port and the PC's serial port.

Tip: If you are connecting through a modem, use a null modem adapter on the NSU side.

Creating a Dial-Up Network Connection on Windows 95/98

Typically, you need to follow this procedure twice to create two Dial-up Networking connections, one for on-site direct access, and one for remote modem access.

1. On the **Start** menu, point to **Programs**, point to **Accessories**, and then click **Dial-Up Connections**.
2. Double-click **Make New Connection**.
3. Enter an appropriate name for the connection (for example, Direct for direct connections, Remote or a customer's name for remote connections) and click **Next**.

Tip: If you are creating a direct connection, make sure NT Direct Connection is listed in the drop-down list in the **Make a New Connection** window.

4. Enter an **Area Code** and **Telephone Number** and select a **Country Code** from the drop-down list. Click **Next**. Click **Finish**.
5. Right-click your new connection icon and click **Properties**.
6. Click **Configure**. Ensure the fields are set as follows:
   - Data bits: **8**
   - Parity: **none**

   For a direct connection:
   - Maximum speed: **38400**
   - Check: **only connect at this speed**
   - Select: **wait for dial tone before dialing**
   - Select: **cancel the call time at 60 sec**
   - Click **Advanced** and turn off **error control** and **flow control**

   For a remote connection:
   - Stop bits: **1**
   - Click **Advanced** and turn on **error control** and select Compress data.
   - Turn on **flow control** and select Hardware.
7. Click **OK**.
8. Select **Server Types** tab and make sure that PPP: Windows, WindowsNT3.5, Internet or PPP:Internet appears in the Type of Dial-Up Server field.
9. In the **Advanced Options** field, select **Log onto Network and Enable software compression**.
10. Make sure that only **TCP/IP** is selected in the **Allowed network protocols** field.

11. Select the **Scripting** tab and enter:
    - for a 3300 Universal NSU: **c:\program files\mitel\ lmat\pridun.scp**.
    - for an R2 NSU: **c:\program files\mitel\lmat \r2dun.scp**.
12. Click **OK**.

Upgrading to a 700-User Controller

You can increase the capacity of a 250-user controller to that of a 700-user controller by adding the following modules:

- One DSP module for telecom support (21061/21161 based).
- One Dual FIM module.
- One 64-Channel echo canceller.

Tip: A second 64-channel echo canceller can be added, or the existing 64-channel echo canceller can be replaced by a 128-channel echo canceller.

Tip: To add compression channels to the upgraded system, see "DSP Module" on page 166.

Refer to "Determine Controller Module Configuration" on page 39 for module slot locations.

To upgrade a 250-user controller to a 700-user controller:

1. Power down the controller (see page 127).
2. Disconnect all cables from the controller.
3. Remove the controller cover (see page 47).
4. Install the Dual FIM module if you are adding peripheral cabinets or NSUs (see "Dual Fiber Interface Module (FIM)" on page 166).
5. Install the DSP module in Slot 7 (see "DSP Module" on page 166).
6. Install the 64 echo canceller module in Slot 6 (see "Echo Canceller" on page 166).
7. Replace the controller cover.
8. Reconnect the cables to the controller.
9. Power up the controller (see page 24).

Migrate SX-2000 PBX Hardware

Only the MicroLight can be migrated using this procedure. To migrate an SX-2000 Light Non-redundant system simply replace the control cabinet with a 3300 controller.

To upgrade SX-2000 MicroLIGHT hardware for 3300 ICP control:

1. Remove the Main Controller (MMC) from slot 1/1/1.
2. Install a triple FIM in that slot.
3. Remove any FIM carrier cards in the DSU slots.
4. Do NOT remove any other cards.

Tip: Refer to Knowledge Base Article 04-1000-00068 (TB 58005193) for Migration procedure details.

An SX-2000 MicroLIGHT system converted to 3300 control uses fiber interface modules (FIM) of the triple FIM carrier card as required:

- One triple FIM carrier card
- One control resources card
- One peripheral switch control (PSC) Card
- One to eight peripheral interface cards (PIC)
- Optionally, one to four DSU cards 0 DSU1 through DSU4.

Table 123: Triple FIM Carrier Card Ports Support Matrix

Triple FIM Carrier Card Port	When connected, support
Circuit 1 (bottom)	PER cards
Circuit 2	DSU in slots 2 and 3
Circuit 3 (top)	DSU in slots 4 and 5

Any DSU or peripheral cabinets that were connected to the MicroLIGHT, must now be connected by fiber directly to the 3300 ICP controller.

Figure 173: SX-2000 MicroLIGHT under 3300 control

Collecting System Logs Manually

Collecting System Logs - Release 5.1 System

To collect the logs on a Release 5.1 system:

1. Log into the System Administration Tool (see page 71).
2. Select **System Diagnostics** and then click **Export**.
3. Click **Export** and then click **Continue**.
4. After the **File Download** dialog box appears, click **Save**.
5. Navigate to a folder or network drive on your PC. Ensure that the file extension is set to (**.tar**).
6. Click **Save** and then click **Close**.

To collect the logs through PC to controller network connectivity:

1. At the DOS prompt, type **cd c:\3300log** (example folder name)
   Type **ftp <ip address of the controller>**
   Enter the ESM username and password when prompted.
   You should see the ftp prompt when you successfully log in.
   Type **binary**
   Type **hash**
   Type **prompt**

2. Type **cd /db/database/files**
   Type **get pstswlog.db**
3. Type **cd /db/database/sw_log_backup**
   Type **mget *.db**
4. Type **cd /db**
   Type **get xrtc**
   Type **get xe2t**
   Type **get e2tpremortem.txt**
   Type **mget premortem*.txt**
5. Type **cd /db/spylog**
   Type **get system.wvr**
6. Type **cd /vmail /c/voxdrv**
   Type **get diag.dat**
   Type **get diag.sav**
   Type **cd /vmail/c/vm**
   Type **get master.dat**
7. Type **bye**.
8. Zip all of the files in the folder that you created (**c:\3300log** in this example) and send to Product Support in an e-mail with your problem ticket number.

Collecting System Lockup Logs Manually

In the event of a system lockup for software prior to Release 5.2, complete this procedure, then go to “To collect the logs through PC to controller network connectivity:” on page 412. This procedure is needed to obtain **system.wvr** logs and output from **RTC console**.

To prepare to for collecting system lockup logs:

1. Save the “HardResetHook” commands in a text file called **sysinfo.txt**. The file is also available at ftp://ftp.mitel.com/outgoing/.
   wvSpy 20, “system.wvr”, 3
   i
   HardResetHookAddTaskName “DRATask
   . . .
   . . .
   HardResetHookGroupTaskTrace
2. FTP sysinfo.txt file into the db directory of the 3300 ICP:
   At the DOS prompt, type **cd c:\sysinfo.txt**
   Type **ftp <ip address of the controller>**

Login with the ESM username and password.
Type **binary**
Type **cd /db**
Type **put sysinfo.txt** (OR enter each command at the RTC console)
Type **bye**

3. Execute the sysinfo.txt on the RTC Console if the 3300 ICP locks up:
Access RTC Console via communication software (i.e. HyperTerm).
Type **cd "/db"**
Type **<sysinfo**

4. Collect all required logs. See "To collect the logs through PC to controller network connectivity:" on page 412.

Peripheral Cabinet

Tip: Refer to the Release 7.0 version of the Technician's Handbook for SX-2000 peripheral cabinet information.

Digital Service Unit (DSU)

Tip: Refer to the Release 7.0 version of the Technician's Handbook for Digital Service Unit information.

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